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EPITOME OF THE RUSSO-JAPANESE WAR

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ADJUTANT GENERAL
HEADQUARTERS

EPITOME OF THE RUSSO-JAPANESE WAR.

LANDING OF THE FIRST JAPANESE ARMY.

The rupture of diplomatic relations by Japan on February 6, 1904, was coincident with the dispatch of the first expedition to the theater of operations. On this date Vice-Admiral Togo left Sasebo with a fleet of 7 battle ships, 18 cruisers, a flotilla of destroyers and one of torpedo boats, conveying the transports *Tairen*, *Otaru*, and *Heijo*, carrying troops belonging to the Twelfth Division.

The squadron rendezvoused off Mokpo (southern Korea) on the next day, and from that point Togo sent Rear-Admiral Uryu, with 4 cruisers and a torpedo-boat flotilla, to convoy the transports to Chemulpo, the port of Seoul, and sailed for Port Arthur with the remainder of the fleet.

Admiral Uryu arrived at Chemulpo on February 8, and all the troops were safely landed. On the next day Uryu engaged the Russian cruiser *Varyag* and gunboat *Korietz* which had been lying in Chemulpo Harbor, and which, after an engagement of about one hour, returned to the harbor, where they were destroyed by their commanders the same evening. On the night of February 8 Togo sent a torpedo-boat flotilla against the Russian fleet at Port Arthur and succeeded in inflicting such damage that the Japanese evidently concluded they could continue the transportation of troops to the theater of war.

By February 15, 12 transports, carrying about 3,000 horses and 14,000 troops, were loaded at Nagasaki and sailed to reinforce the troops landed at Chemulpo.

The First Japanese Army, of which the force landed at Chemulpo on February 8 was the advance guard, was commanded by General Kuroki, with General Fujii as chief of staff. It consisted of the Second, Twelfth, and Imperial

Guards Divisions,^a commanded, respectively, by Lieutenant-Generals Nishi, Inouye, and Hasegawa. The two brigades of the Second Division were commanded by Major-Generals Matsunaga and Okasaki; of the Twelfth, by Kigoshi and Sasaki; of the Guards, by Asada and Watanabe. At the crossing of the Yalu the artillery included also twenty 12 cm. howitzers.

Primarily the Japanese intended to land the First Army at Sun Chong on the bay of the same name, in the extreme southeast of Korea, about halfway between Masampo and Mokpo, and march thence to Seoul, and preparations were in progress with that end in view. Their success at Port Arthur and Chemulpo, however, allowed the use of Chemulpo and practically advanced their campaign one month.

The main portion of the command landed at Chemulpo on February 8, proceeded to Seoul, the capital of Korea, moving principally by rail, and reinforced the Japanese garrison of 250 men stationed there. This not only gave the Japanese a great political advantage in Korea, but was the beginning of General Kuroki's advance by the main highway leading to the Yalu.

The landing of troops and supplies was pushed at Chemulpo, but the harbor is not favorable for rapid work. For example, the Fourteenth Regiment arrived on February 18 and its landing was not completed until the 21st.

On February 14 two companies were sent, one to Fusan and one to Gensan, the latter by marching from Seoul. One company of the Fourteenth Regiment was sent by steamer to Waichu, whence it marched to Phyangyang, arriving February 20. The northern advance of General Kuroki may be said to begin with the movement of the latter company. The advance by land began with the divisional cavalry and Fourteenth Regiment under Major-General Sasaki on February 22.

^aEach Japanese division contained normally four regiments of infantry, one of cavalry, one of artillery, and the various detachments of technical troops, making a total of about 14,000 effectives and 6,000 noneffectives. The regiment of cavalry, that of artillery, and the battalion of engineer troops have the same numerical designation as the division of which they form a part.

On March 5 Major-General Yamani, of the Japanese engineers, arrived with several officers and 300 engineer troops, for the purpose of constructing the Seoul-Wiju Railway.

A Japanese detachment of 6 squadrons and 1 battalion landed at Chinampo on March 13 and marched to Anju.

The Twelfth Division started north from Phyangyang on March 21, the head of the Guards Division, two battalions, with General Kuroki, arriving from Chinampo, where it had landed, about noon of that day. They were followed by the remainder of the division under Lieutenant-General Hasegawa.

On March 29 the entire Second Division had completed its landing at Chinampo, thus raising the force moving northward to about 45,000 men. The Guards and Second Division had begun embarking at Ujina, the port of Hiroshima, on March 8.

The occupation of Phyangyang allowed troops and supplies to be landed at Chinampo, about 40 miles distant by a road free from difficult grades. This was a saving of 120 miles over the route previously used via Seoul. Profiting by high tides, supplies were towed up the river in sampans and landed at Mankundai, only 7 miles from Phyangyang. Chinampo had the further advantage of a direct road to Anju, saving from 10 to 15 per cent of the distance via Phyangyang.

Speaking of the manner of advance an eyewitness says:

The advance movement of the Japanese troops resembles the coaling of a ship by small baskets at Nagasaki; rarely does a larger unit than a battalion move at one time.

Moving north from Phyangyang to Anju the Twelfth Division moved on the Syunchyen road; the Guards, on the Syunan road; the Second Division, along the seashore.

A company of Japanese infantry, from the Guards Division, with some cavalry, came into conflict with a body of about 600 Russian cavalry south of Chengju, March 28. Four Japanese, including an officer, were killed and 12 wounded. The detachment occupied Chengju the same day.

The skirmish began at 11.50 a. m., near the south gate of the town where the Japanese cavalry was fired upon. They then rode around to the north gate while the infantry attacked the south gate.

The Russians, from the First Chita Regiment, commanded by Colonel Paylov, withdrew toward Wiju. This regiment and the First Verkhne-Udinsk formed the Cossack brigade, commanded by Major-General Mishchenko, which reconnoitered the Japanese approach.

On April 4 the Japanese advance guard reached and occupied Wiju, the opposing cavalry having crossed to the right bank of the Yalu on the preceding day.

On April 10 and 12 small detachments of Russians attempted to cross the Yalu below Wiju, but failed in both cases after sharp skirmishes.

In the meantime Kuroki concentrated his army at and near Anju and, on April 7, moved on Wiju, leaving small infantry garrisons at Chinampo and Phyangyang. Supplies were landed from the sea at the mouth of the Chyongehyen River, Usiho, and on the Chiulsan Peninsula, thus materially relieving the demands upon the single road over which the army was moving.

Major-General Sasaki, with a covering detachment of 3 battalions, 1 squadron, 2 mountain batteries, and accompanying service troops, was held at Phyangyang until the rear of the army left Anju. The detachment then marched on Chongsung, where it arrived about the same date as the main body arrived at Wiju, April 20.

The twenty 12 cm. howitzers landed at Ihoaphu about April 10 and reached Wiju on the 26th.

The occupation of Wiju again brought relief to the line of communications back through Anju, Phyangyang to Chinampo. It allowed troops and supplies to be landed in the estuary of the Yalu, as at Yongampo.

This shortening of the line of communications was of incalculable benefit, for, across a large river not fordable below Suikouchen (8 miles above Wiju), a not inconsiderable force faced the First Japanese Army.

This Russian force, called the Eastern Detachment, based on Liaoyang, with secondary base at Fenghuangcheng, consisted at first of 8 battalions, 32 sotnias, and 38 guns. On April 22 Lieutenant-General Zasulich arrived and took command of the reenforced Eastern Detachment, which then contained about 25,000 effectives, and was reorganized as follows: The main body consisted of the Ninth, Tenth, Elev-

enth, Twelfth, and Twenty-fourth East Siberian Rifle Regiments, the First, Second, and Third Batteries of the Third East Siberian Artillery Brigade, the Second and Third Batteries of the Sixth East Siberian Artillery Brigade, and 1 machine gun company (18 battalions, 40 guns, and 8 machine guns), and held the right banks of the Ai and Yalu rivers in the region opposite Wiju.

The left flank detachment consisted of the Argunsk and the Ussuri Cossack regiments and 1 mountain battery (12 sotnias and 8 guns) under command of Colonel Trukhin, and covered the left flank and the road leading to Kuantien and Saimachi.

The right flank detachment consisted of Major-General Mishchenko's Cossack brigade reenforced by the Twenty-first East Siberian Rifle Regiment, the First Battery of the Sixth East Siberian Artillery Brigade, and 1 Transbaikalian horse battery (3 battalions, 12 sotnias, and 14 guns), and was charged with reconnoitering the coast from the mouth of the Yalu to Takushan.

THE BATTLE AT YALU RIVER.

(Plate I.)

On the morning of April 26 one battalion of the Guards, crossing by pontoon ferry, drove the Russian outpost from and occupied the island of Kyurito.

On the same morning work was begun on a bridge across the first branch of the river near Wiju. The work was interrupted by the Russian artillery from Conical Hill and a point farther south. The bridge, 237 meters long, and constructed of piles, junks, and other local material, was finally completed on the 27th. On the 27th a bridge was constructed at "a," opposite the southern wall of Wiju. It also was of improvised material, and about 80 meters long.

On the 26th also a small bridge, 30 meters long, was constructed at "b;" the small bridge just above "b" was constructed on the 28th. On the night of the 27th the two small bridges at "c," 108 and 113 meters long, were constructed.

In the meantime a Japanese river flotilla of 2 torpedo boats, 2 gunboats, and 4 armed launches came up the Yalu on April 25, was fired upon by the Russians, and retired to

Yongampo. On the 26th it returned with a large number of junks loaded with bridge material and made a demonstration against Antung. The Japanese claim this demonstration caused the Russians to send their reserves to Tientzu, thus materially weakening their forces facing the intended crossing.

It is to be noted that the main road from the Yalu to Fenghuangcheng starts from Antung and passes through Tientzu. The roads from Chiuliencheng and from Chingkou join at Hamatan and reach the Antung-Fenghuangcheng road at a point about 2 miles north of Tientzu.

On the night of April 28 the Twelfth Division, except one battalion, 1 squadron, and 1 mountain battery, left at Chongsung, concentrated near Suikouchen, and began building a bridge the next morning. A regiment of infantry began crossing by pontoons about noon of the 29th, but was met by the fire of 2 companies, 3 sotnias, and 2 mountain guns from Colonel Trukhin's force. One battalion, however, succeeded in crossing, and covered the bridge building and the further crossing. The bridge, 265 meters long, was completed at 3 a. m. on the 30th, and the main body of the Twelfth Division crossed and moved to the west against Hushan.

In the meantime the Russian detachment which had resisted the crossing at Suikouchen fell back, the sotnias going to Hsiulun, about 30 miles north of Wiju, where they were joined the same day by the remainder of Colonel Trukhin's command, which had marched there by order of Lieutenant-General Zasulich to cover the road leading to Kuantien.

On April 29, under cover of the fire of the battery near Potichtun, a Russian detachment crossed the Ai River near that village and drove a battalion, some cavalry, and some mountain guns from the Guards, which had occupied the Litzuyen Valley and Tiger Hill on the preceding day, back to Kyurito Island. The Russian detachment was then checked by the fire of the Guards artillery from near Wiju.

At 9 a. m., on April 30, two battalions of the Guards artillery and the twenty 12 cm. howitzers began firing on the Russian trenches at Conical Hill. The Russian battery there replied until 11 a. m. and then ceased firing. The

remaining battalion of the Guards artillery took up a position on Kyurito Island, and the advance guard of the Twelfth Division attacked and forced back across the Ai River the Russian detachment at Litzuyen. By noon the main body of the Twelfth Division was in position about 2 miles east of and facing the Ai River.

A battalion of the Guards occupied Tiger Hill and the construction of the bridges at P, Q, and R (237, 310, and 90 meters long, respectively) was begun. The bridges were ready for use about 8 p. m.

At daybreak of May 1 the Twelfth Division was close to and facing the Ai River, its artillery being near Litzuyen, its right near Shalankou; a detachment was moving from Shalankou toward the Chingkou ford (this detachment took no part in the battle proper, not crossing the Ai until the Russians at Chingkou ford had been driven away). The Second Division was southwest of Tiger Hill. The Guards Division occupied a line from Tiger Hill north to Litzuyen, having followed the Second Division to Tiger Hill from its point of concentration. The reserve, 2 regiments of infantry, less 1 battalion each, and 2 of cavalry, was on Kyurito Island.

The Russian troops holding the right bank of the Ai River were commanded by Major-General Kashtalinski, and were distributed as follows:

At and near Chiuliencheng were the Twelfth Regiment, 1 battalion of the Eleventh Regiment, the Second Battery of the Third Brigade, and the machine-gun company.

At and near Potiehtun were 2 battalions of the Twenty-second Regiment and 6 guns of the Third Battery of the Sixth Brigade.

At Chingkou were one battalion of the Twenty-second Regiment and 2 guns of the Third Battery of the Sixth Brigade.

The remainder of the troops commanded by General Zasulich was distributed as follows:

At and near Antung were the Tenth and Twenty-fourth Regiments and the Second Battery of the Sixth Brigade.

At Tientzu, as general reserve, were the Ninth Regiment, two battalions of the Eleventh Regiment and the Third Battery of the Third Artillery Brigade.

The right flank detachment, under Major-General Mishchenko, was guarding the coast from the mouth of the Yalu to Takushan.

The main body of the left flank detachment, under Colonel Trukhin, was at Hsiulun, guarding the road to Kuantien, with lesser detachments from the mouth of the Anping River, just above Suikouchen, to a point about 30 miles farther upstream.

At 5.20 a. m., on May 1, the Japanese opened fire on the right flank of the Chiuliencheng position from the 12 cm. howitzers. A little later the artillery of the Second Division, from west of Wiju, and that of the Twelfth Division, from near Litzuyen, opened fire. At 7 a. m. the 6 Russian guns northeast of Makou began firing on the Guards artillery.

At 7.30 a. m. the Japanese infantry moved forward. As it approached and was fording the Ai River it came under the fire of the Russian infantry and machine guns, and suffered considerable loss. The Russian artillery had ceased firing. The Twelfth Division made the more rapid progress in the series of attacks delivered from the base of the hills on the right bank of the Ai River, and the two battalions of the Russian Twenty-second Regiment holding the Potiehtun position were the first to give way. Their withdrawal was disorderly, the greater portion going toward Chingkou and thus exposing the left flank of the Chiuliencheng position. The battery took up a second position at "V," but having no infantry support and having lost heavily in men and horses, the 6 guns were abandoned to the Japanese. Shortly before noon Major-General Kigoshi's brigade, the right of Twelfth Division, drove back the battalion of the Twenty-second Regiment holding the Chingkou ford, and followed the retreating Russians toward Laofankou. At the same time the Japanese infantry resumed the assault on the left flank of the Chiuliencheng position, being aided by the artillery on Chukoutai Island. The troops holding the Chiuliencheng position then withdrew to the position at "Y" under cover of the fire of the machine gun company and that of the Second Battery of the Sixth Brigade, which had arrived from near Antung. The Japanese reserve arrived at Conical Hill, the Second Division was directed on Antung,

the Guards and reserve continued moving toward the Russian position at "Y" and toward Hamatan.

Hearing of the retreat of the battalion from Chingkou ford and the renewal of the Japanese advance near Chiuliencheng, Lieutenant-General Zasulich decided about noon to retreat to Fenghuangcheng. Two battalions of the Eleventh Regiment and the Third Battery of the Third Brigade were sent from the reserve to a position, designated by Major-General Kashtalinski, to the east of Hamatan. The two battalions took up positions facing east and north, but, finding the ground of such nature as to render artillery fire impracticable, Major-General Kashtalinski ordered the battery to withdraw.

By 1.45 p. m. the Japanese had pressed the Twelfth Regiment, the battalion of the Eleventh Regiment, and the machine-gun company back on the position at Hamatan. The Third Battery of the Third Brigade, which was endeavoring to carry out the order to withdraw, came under a cross fire at close range and was compelled to cease its withdrawal and take up a position. The machine-gun company took up a position and for a time held the Japanese back from this battery. In doing this the machine-gun company lost all of its horses and about half of its personnel. The Second Battery of the Sixth Brigade, which had aided in covering the withdrawal from the Chiuliencheng position, found its loss in horses so great as to prevent withdrawal of the guns from the position at "Y".

The Twelfth Regiment withdrew through the Hamatan position, which the Eleventh Regiment continued to hold for two hours more, thus facilitating the withdrawal of the Russians from the vicinity of Antung. In the meantime Major-General Kigoshi's brigade, moving from Chingkou, had a severe skirmish south of Laofankou, and 2 guns took up a position at "Z." The left of the Twelfth Division had moved from the Potiehtun position toward Hamatan.

At 4 p. m. the remnants of the Eleventh Regiment began to withdraw toward Fenghuangcheng, being assisted in cutting their way through by the fire of a battalion of the Tenth Regiment, sent from the reserve to hill 522 northwest of Hamatan.

The Japanese reported a loss of 5 officers and 218 men killed and 33 officers and 780 men wounded, and the capture of 22 field guns, 19 artillery ammunition wagons, 1,417 shells, 8 machine guns, 8 machine-gun wagons, 37,300 machine-gun cartridges, 1,021 rifles, 51 small-arms ammunition wagons, 353,005 rounds of small-arms ammunition, 63 horses, various minor articles, including some taken at Fenghuangcheng, and 18 officers and 613 men as prisoners.

Lieutenant-General Zasulich reported a loss on April 30 and May 1 of 70 officers and 2,324 men killed, wounded, and taken prisoners. Major-General Kashtalinski was among the wounded.

Another Russian report gives 28 officers and 564 men killed, 38 officers and 1,081 men wounded, and 6 officers and 679 men missing.

The Russians retreated on Fenghuangcheng and were followed by the Japanese First Army. On May 6 there were cavalry skirmishes northeast of Fenghuangcheng, which was that day occupied by a detachment of Japanese infantry. This advance was accompanied by extensive reconnaissance, Kuantien being occupied by a Japanese detachment on May 5, while on the 11th occurred a skirmish with a force from the Chita Regiment of Mishchenko's brigade, withdrawing westward.

On May 10 a detachment of Cossacks attacked Anju, having come down the Chosan-Anju road, but, after a skirmish lasting the greater part of the day and until the morning of the 11th, the attacking force was driven off by reinforcements arriving from Kasan. Had this attack been made just prior to General Kuroki's crossing of the Yalu and more vigorously pushed, it would undoubtedly have caused the Japanese commander considerable apprehension or even have delayed the crossing; but, as it turned out, the Japanese army had crossed the river and was no longer tied to its line of communications back through Anju, since reinforcements and supplies were now landed near the mouth of the Yalu.

An advance beyond Fenghuangcheng was not undertaken until other troops had landed and could move in cooperation with the First Army.

LANDING OF THE SECOND JAPANESE ARMY.

On May 5, 1904, the Second Japanese Army, commanded by General Oku and consisting of the First, Third, and Fourth Divisions and the First Artillery Brigade, began landing troops of the Third Division a short distance south of Pitsewo. On the 6th the First Division also began landing. On the 7th the place of disembarkation was shifted to a point about 7 miles southwest of Pitsewo. The landing was practically completed on the 13th. Lieutenant-Generals Fushimi, Oshimi, and Ogawa commanded the First, Third, and Fourth Divisions, respectively; Major-General Uchiyama, the artillery brigade.

This force had been in readiness for some time, the First Division having left Tokyo about March 19, and with the Third Division and First Artillery Brigade was ready for embarkation from Hiroshima on April 18. The Fourth Division began embarking at Osaka on April 22. The transports containing the Second Army concentrated at Chinampo, where they remained until the after First Army had crossed the Yalu.

To protect the landing and the large fleet of transports carrying the Second Army, Admiral Togo, in the early morning of May 3 made his third attempt to block Port Arthur, sending in eight vessels to be sunk in the channel for that purpose.

Two detachments were sent out from the Second Army on the 5th, one to Pitsewo, to cut the telegraph line running to Pulantien; the other, across the isthmus, to cut the railway and telegraph line at Pulantien (Port Adams), near the opposite coast. Both detachments succeeded. The Pulantien detachment arrived on the 6th, cut the railway and telegraph, and returned to rendezvous on the 7th. The cutting of the railway seems to have been confined to the destruction of a bridge.

On the afternoon of the 7th another detachment was sent out with the object of breaking the railway between Pulantien and Sanchilipu. On the 8th it cut the telegraph and railway near Lungkou, about 4 miles north of Sanchilipu, after a skirmish.

To gather information of the landing and guard the southern portion of the railway between Wafangtien and Chinchou,

there was sent to Wafangtien the Second Brigade of the Ninth East Siberian Rifles Division, the Second Transbaikalian Cossack Battery, and a squadron of cavalry, under command of Major-General Zikov.

Lieutenant-Colonel Spiridonov, with a platoon of the Fourth Trans-Amur Railway Battalion, repaired the railway bridge that had been destroyed on the 7th at Pulantien. This allowed a train load of ammunition to be taken to Port Arthur on May 10.

On May 12 another Japanese detachment cut the railway between Pulantien and Wafangtien, permanently suspending railway communication with Port Arthur.

On the 15th the greater part of the infantry of the Fourth Division and the Thirteenth Regiment of the Artillery Brigade moved to a position astride the railway and about midway between Pulantien and Chinchou. The First Division occupied a position astride the Pitzewo-Chinchou road and about 8 miles from Chinchou. The Third Division and army reserve occupied a position facing north on the hills south and east of Pulantien.

On the 16th there was a skirmish at Shisanlitai, north of Chinchou, where the troops of the Japanese First Division attacked a Russian force of 3 battalions and 8 guns. The Japanese drove the Russians back, losing 9 officers and 162 men killed and wounded, and the Fourth and First Divisions occupied Kiulichuang and hills to the north of Chengchiatun. The Russian force retreated on Chinchou, reporting the Japanese force at and near Sanchilipu to consist of 2 divisions and 6 batteries; the Japanese concluded that the Russian force in the vicinity of Chinchou and Nanshan, and commanded by Lieutenant-General Fock, consisted of the whole of the Seventh East Siberian Rifle Division and a portion of the Fourth East Siberian Rifle Division, subsequently placing the Russian force between 9,000 and 10,000 men. In this engagement the Russians lost 10 officers and 150 men killed and wounded.

On the 16th Rear-Admiral (the younger) Togo made a demonstration on the west coast of the peninsula, in the neighborhood of Kaiping, firing on some Russian troops near the coast. On the 17th he entered Chinchou Bay and fired on railway bridges and a military train.

On May 19 the Fifth Japanese Division began its disembarkation, which was completed on the 22d. The First Cavalry Brigade and the Eleventh Division arrived and disembarked shortly after the Fifth Division.

BATTLE OF NANSHAN.

(Plate II.)

On May 23 the Fourth, First, and Third Divisions, in the order named from right to left, concentrated in rear of the line Kiulichuang, Chengchiatun, Chaitzuho (southeast of Chengchiatun), and spent the remainder of that day and all the next in reconnoitering the Russian position.

On the 25th the Russians observed the Japanese forces for six hours from a balloon. The Japanese artillery fired at the balloon, but were unable to hit it, giving as a reason that the sky was overcast and the color of the balloon blended with that of the clouds.

On the 25th the Japanese advanced to Lungwangmiao, Sanlichuang, Chengchiatun, Wangchiatun, and that night small parties attacked Chinchou, which fell into their hands about 5.20 a. m. on the 26th. The attack was continued on the 26th, and, after a desperate struggle, Nanshan was occupied about 7 p. m., the Russians retiring toward Port Arthur.^a

Four Japanese vessels, the *Tsukushi*, *Heiyeu*, *Akagi*, and *Chokai*, accompanied by a torpedo-boat flotilla, took part in the battle from Chinchou Bay, firing on the western portion of the Russian position, especially the heights of Suchiatun and later those of Nankuanling, the *Akagi* and *Chokai* being engaged throughout the day. The Russian gunboat *Bober* bombarded the Japanese left flank from Talienwan Bay on the 26th.

a Japanese forces at Nanshan.

Division.	Infantry regiments.	Cavalry regiments.	Artillery regiments.
1st.....	1st, 15th, 2d, 3d.....	1st.....	1st.
3d.....	6th, 33d, 18th (34th) ..	3d.....	3d.
4th.....	8th, 37th, 9th, 38th ...	4th.....	4th.
1st Artillery Brigade	13th, 14th, 15th.

The Thirty-fourth Infantry, 2 squadrons and 1 artillery battalion of the Third Division, and 1 battalion and 2 squadrons of the Fourth Division were with the Fifth Division holding the line from Pulantien to the Tasha River. The companies of the Fifth Engineer Battalion were present at Nanshan.

Combatant strength, 38,740; total strength, 53,740.

The engagement of the 25th was mainly an artillery duel. The 26th also opened with an artillery duel at about 5.30 a. m. At 6 a. m. the infantry of the Fourth Division advanced west of Chinchou, the extreme right wading through the waters of the bay, reaching a line west of Liuchia-tien about 8.30 a. m. Then the infantry of the First Division moved forward and prolonged this line east through Liuchia-tien and then southeast. About 7.50 a. m. the infantry of the Third Division began moving forward and prolonged the line of the First Division, its own left resting near Liuchiakou. The Japanese artillery, which had obtained the mastery over the Russian artillery after firing about one hour, also advanced nearer to Nanshan. Two Russian field batteries retired to an elevation east of Nankuanling, from which they maintained a persistent fire on the Third Division. In addition the Russians strengthened their right, and, with the aid of the gunboat *Bober*, inflicted great loss on the left of the Third Division.

From 9 a. m. to 6 p. m., notwithstanding the Russian artillery at Nanshan proper had ceased firing, repeated attacks of the Japanese infantry were repulsed by the Russian infantry and machine-gun fire, and with the exception of small attacking parties the Japanese line remained practically stationary at about 500 yards from the Russian trenches. About 6 p. m. the Fourth Division began moving forward, assisted by its artillery and the fire of the vessels in Chinchou Bay. The Seventh Brigade advanced its extreme right so far as to practically turn the position. The Russians then began their withdrawal. The Fourth Division then reached the Russian position about 7.10 p. m. and was closely followed by the First and Third Divisions.

Not only was the Fourth Division aided by the fire of the vessels, but it was confronted by the weakest portion of the Russian position. The greater portion of the defensive works faced the east, northeast, and north.

General Oku reported casualties as follows: Officers, 21 killed and 100 wounded; noncommissioned officers, 5 killed and 12 wounded; privates, 713 killed and 5,343 wounded—a total of 739 killed and 5,455 wounded.

General Stoessel reported a loss of about 30 officers and 800 soldiers killed and wounded.

General Oku reported the capture of about 68 cannon, 10 machine guns, an electric battery, 3 searchlights with dynamo, 50 mines, a quantity of rifles and ammunition; also that his army buried the bodies of 10 officers and 664 men of the Russians at Nanshan.

On the 27th the Japanese occupied Nankuanling. On the same day a detachment occupied Liushutun (the terminus of the Talienwan branch railway), securing 4 guns, some ammunition, and 45 freight cars. The Russians on the same day evacuated Dalny, which was occupied by the Japanese on May 30.

On this latter day an engagement occurred at Lichiatun, 22 miles north of Pulantien, between the First Cavalry Brigade and a Cossack brigade under Major-General Simonov. On the 3d of June there was another skirmish near Chinchiatun, and again on the 4th, south of Telissu at Chienshiatun. These skirmishes were between reconnaissance parties of the Japanese Fifth Division and its attached troops, holding the Pulantien-Tasha River line, on one hand, and the advance guard of General Stackelberg on the other, the latter having begun concentrating his troops from Yingkou and Kaiping to aid the Port Arthur garrison, the advance guard of 2 regiments of infantry, 2 regiments of cavalry and 8 guns arriving at Mauchialing, Telissu, and Wafangtien between May 28 and 31. The Japanese First Cavalry Brigade retired before this advance guard, arriving near Pitsewo June 6.

General Stackelberg had under his command the First and Ninth East Siberian Rifle Divisions with their accompanying First and Ninth East Siberian Artillery Brigades (First Siberian Corps), the Second Brigade (Glasko) of the Thirty-fifth Infantry Division with its accompanying half of the Thirty-fifth Artillery Brigade, the Ninth (Tobolsk) Siberian Infantry Regiment (from the Third Siberian Division), one brigade of the Siberian Cossack Division, the Ussuri Mounted Brigade (2 sotnias of Frontier Guards and the Primorski Dragoon Regiment), a Frontier Guard battery, the Second Trans-Baikal Cossack Battery, and the East Siberian Sapper Battalion; a total of 36 battalions, 20 sotnias and squadrons, and 98 guns, with a possible strength of 42,000 foot and 3,000 mounted men.

BATTLE OF TELISSU OR WAFANGKOU.

(Plate III.)

On June 6 the troops already landed and still landing near Pitsewo were divided into two armies. The First Division, reenforced by the Ninth and Eleventh Divisions, became the Third Army, and later moved on and besieged Port Arthur. General Oku, with the Third, Fourth, and Fifth Divisions, the First Cavalry Brigade, and First Artillery Brigade, started north on June 13 from near Pulantien, the Third Division and artillery brigade (less one regiment) moving along the Tasha River, the Fifth Division along the railway line, the Fourth Division and Fourteenth Regiment (artillery brigade) along the Wuchiatun-Ssuchuankou-Tahoya road leading toward Fuchou, and the cavalry brigade along the Pitsewo-Hsiung-yocheng road. The Sixth Division began landing at Pitsewo on June 13, and a portion arrived near Telissu during the battle, thus bringing the Japanese total to about 50,000 men and 180 guns.

The Third Division came into contact with the Russian advance guard, which had retired from Wafangtien, on the afternoon of June 14 and drove it back. The Russian guns northeast of Lungwangniao then opened a fire that was replied to by the Third, Thirteenth, and Fifteenth Japanese artillery regiments for about two hours. The first line of the Japanese Third Division, after some skirmishing, reached a line through heights 987, 962, the one northeast of and next to 962, and 1400. The advance guard of the Fifth Division took part in this engagement, advancing until its right rested on height 700 and its left on the Fuchou River.

General Oku ordered the Third Division to hold the line of its advance guard. The Fifth Division during the night was sent to occupy the hills west of Tayankou with orders to attack at dawn. The Fourth Division was at Nachialing; the troops of the Sixth Division that arrived were held in reserve. The First Cavalry Brigade was at the crossing of the Tasha River on the Pitsewo road.

To meet the Japanese advance, General Stackelberg had placed the Thirty-third and Thirty-sixth Rifle Regiments and 2 batteries on the heights north of Tafangshan, the Fourth and Third, in order named, 2 field batteries and 1 mountain

battery to the east of the railroad; the Thirty-fourth, the Thirty-fifth, and 2 batteries in reserve between Telissu and the station; the brigade of the Thirty-fifth Division about 1 mile east of the station. When the Russian advance guard was driven back on the 14th, the First and Second Rifle Regiments prolonged the main Russian line to the east, the cavalry of the advance guard, under Major-General Simonov, retired to and took position at Lungkou.

Early in the morning of June 15, leaving the Fourth Regiment to hold about 2 miles of the line east of the railway, the First, Second, and Third Regiments moved forward against the Japanese left. The brigade of the Thirty-fifth Division, under Major-General Glasko, was to move by way of Chingchiatun and make a flank attack in conjunction with this attack of the First Division, but, from not starting at a sufficiently early hour and from taking the wrong road either through inadvertence or the misinterpretation of an order, did not arrive on this part of the field until 11 a. m.

In the meantime the Japanese Fifth Division attacked the heights of Tafangshan and, at 6 a. m., the advance of the Fourth Division, from Nachialing, began forming for an attack on Lungkou. By 10 a. m. the Nineteenth Brigade, Fourth Division, had driven the Russian cavalry to north of Lungkou and was in position with its right connecting with the left of the Fifth Division near Wangchiatun, while the remainder of the division had taken position, facing north, south of Kaochiatun. About 10.30 a. m. General Stackelberg sent the two reserve regiments, Thirty-fourth and Thirty-fifth, to attack the Japanese at Lungkou. The attack of the Japanese Fifth Division, aided by the fire of the artillery brigade and by the Nineteenth Brigade on the heights west of Wangchiatun, had progressed so far that the Russians began to withdraw from the heights of Tafangshan about 11 a. m.

By this time the attack of the Russian left had approached close to the Japanese right, and was now prolonged by the arrival of Major-General Glasko's brigade. The Japanese right was, however, after having a portion driven back to the height south of Sungechiatun, reinforced by troops from the general reserve, thus relieving the condition of the Third Division. The Japanese Third Cavalry Regiment, dismounted, was on the right of the Third Division and the

First Cavalry Brigade, also dismounted, attacked the extreme Russian left, but made little progress. The fight on this part of the field continued, the Japanese being again reinforced from the general reserve, until the order to retreat reached the Russian forces, about 3 p. m., although the Fourth Rifle Regiment, the right flank of which was exposed by the Russian withdrawal from the heights of Tafangshan, had given way before the attack of troops from the Third and Fifth Divisions, about 2 p. m. The Russian guns on the heights of Lungwangmiao had ceased firing about noon and were abandoned when this retreat occurred. During this period a Russian battalion made an attack on the height south of Sungchiatun and reached the Japanese line. Desperate hand to hand fighting resulted, in which the Russian battalion was practically annihilated after the remnants had continued the struggle until nearly dark.

The Thirty-fourth and Thirty-fifth Rifle Regiments were unable to recapture Lungkou, but had succeeded in holding back the Japanese advance on that part of the field, and inflicted severe loss on the Nineteenth Brigade. The main body of the Fourth Division moved from Kaochiatun, drove the Russian cavalry still farther north and sent two companies and a battery to the heights east of Lungchiatun (about 8 miles northwest of Telissu), from where they were able to fire upon and severely injure a detachment of Russian cavalry retiring by the Lungkao River road.

The retreat of the Russians was covered by the Tobolsk Regiment, which arrived at Telissu station by rail while the battle was in progress.

The Russians reported a loss of 18 officers killed, 85 wounded, and 10 missing, 459 men killed, 2,155 wounded, and 754 missing.

General Oku reported a loss of 7 officers and 210 men killed, and 43 officers and 903 men wounded. He reported also the capture of 300 prisoners, including 6 officers, a regimental flag, 16 field guns, 46 ammunition wagons, 953 rifles, 37,233 rounds of small-arm ammunition, 1,121 rounds of artillery ammunition, 232 sappers and miners' tools, 1,110 barrels of cement, and other weapons, utensils, etc.

By June 21 Stackelberg had reached Kaiping (Pl. IV), with his rear guard at Senucheng, about 18 miles farther

south, and in contact with the Japanese advance guard, which on that day occupied Hsiungyocheng.

General Oku began now to reconnoiter to the east with the intention of establishing communication with the Japanese Fourth Army, which had begun landing at Takushan on May 19 and had reconnoitered north toward the First Army in the vicinity of Fenghuangcheng and northwest toward Kaiping.

On July 6 a portion of Oku's army attacked and drove back a regiment of Russian infantry on a mountain ridge about $2\frac{1}{2}$ miles northeast of Ssufangtai and a second ridge about $2\frac{1}{2}$ miles north of the same place. At the same time the main force of the Japanese army pushed northward, the opposing cavalry falling back to line of the Erhtao River through Kinchiakou and Hsiaolanchi, the Japanese left wing occupying the heights of Tsuichiatus.

Continuing the advance on July 7 the Japanese army by noon had reached a line extending from Tatzukou to the heights east of Tawanghaisai, the Russian rear guard slowly retiring northward, delaying the advance. The main Russian force was north of the Kaiping River, its artillery being posted on the heights north of Kaiping and those to the west of Hsitai, its right wing resting on the heights of Haishansai, and a detachment of the left wing as far to the east as Huahungkou.

On July 9 the Japanese cannonaded the Russians, who, about 8 a. m., withdrew their artillery to the heights of Shimen and Haishansai, the Japanese occupying the heights of Tapingtun, Tsaichiatus, and Tungshuangtingshan. About noon the Japanese attacked and carried the second Russian position, the artillery of the latter retiring to the heights of Hungchichang, Yaolingtzu, and Shinfotzu and covering the retreat. The Russian forces from Hungchichang and Yaolingtzu concentrated near Tapingchuang on the 10th and subsequently retired to Tashihchiao, the junction of the Port Arthur-Liaoyang Railway with that running to Yingkou.

The Japanese casualties in the neighborhood of Kaiping on July 6 to 9 were 24 killed and 129 wounded; Major-General Koizuma, Major Iwasaki, Lieutenants Iwayama, Morita, and Taniguchi being among the wounded.

The Russian loss was light, not exceeding 200. The

engagement was practically an artillery fight on both sides, General Stackelberg being unable to make a determined stand at Kaiping without imperiling his line of communications, which was threatened by the Takushan army.

The occupation of Kaiping and the country immediately to the north placed General Oku's army on the edge of the Liao Valley, opened the way to Yingkou and Newchwang, and facilitated his further advance to the north by allowing supplies to be received from the sea, thus shortening his line of communications.

OPERATIONS ON THE KUANTUNG PENINSULA.

(Plate V.)

On May 27, the day following the battle of Nanshan, a portion of Major-General Nakamura's (Second) Brigade, First Division,^a occupied Nankuanling, while the main force of the Second Army remained in the villages near Nanshan. The Russians burned the station of Sanshilipu and retired westward.

On the same day a detachment of Nakamura's brigade occupied Liushutun, capturing 4 guns with a quantity of ammunition for the same, 5 box and 40 open freight cars.

On May 29 and 30 General Nogi's army continued to advance westward, and on the latter day occupied a line extending from Antzushan to Taitzushan, the Russians occupying a line through Shuangtaikou and Antzuling.

On May 30 the Japanese occupied Dalny, which had been evacuated by the Russians, capturing about 300 open and 120 box cars, 50 lighters, 2,000 tons of coal and 20,000 railway ties. All the smaller railway bridges in the neighborhood had been destroyed as had also a portion of the larger pier, while three small vessels were found sunk near the entrance and the bay liberally sown with mines. The docks and smaller pier were uninjured.

^a The First Division was now being reenforced by the Eleventh Division, which began to land at Pitsewo on May 24, and was later reenforced by the Ninth Division which landed at Dalny about June 15; also by the Seventh Division, the First and Fourth Kobi Brigades, the Second Brigade of field artillery, 7 battalions of siege artillery, a naval brigade and an engineer and artillery park; the whole forming the Third Army under General Nogi with Major-General Idichi as Chief of Staff.

The occupation of Dalny was of great benefit to the Japanese, as it gave them an excellent harbor which, with Liu-shutun, served as a base for the Third and Second Armies. There were at Dalny over 100 barracks, storehouses, etc., remaining in good condition. The removal of the mines that had been laid by the Russians cost the Japanese considerable time and labor. By the aid of a pilot who had been in the Russian service a fairway was found on June 6, up to which time 41 mines had been discovered and destroyed.

The Russians, holding Shuangtaikou and Fenshuiling in force, advanced their outposts to within 1,000 yards of the Japanese outposts and began to fortify the northeastern foot of the hill east of Shihshankou and the line of heights running north and south through Antzuling from Chengerhshan to east of Poshan.

On June 13 the Fifth and Twenty-eighth East Siberian Rifle Regiments made a vigorous reconnoissance from Chakou and Chuchuantzukou, that did not cease until dark.

On June 14 the *Novik* and two gunboats bombarded the Japanese left flank for about forty minutes from off Heishih-chiao. The *Novik* and 10 destroyers had issued from Port Arthur that morning and driven off the Third Destroyer Flotilla, Commander Tsuchiya, which had been bombarding the Russian right in the vicinity of Hsiaopingtao.

On June 18 a Russian flotilla appeared in the vicinity of Hsiaopingtao and began firing at the Japanese left flank, but was driven off by a Japanese squadron after an engagement of about thirty minutes.

On June 26 the Eleventh Division and the left of the First Division moved forward to occupy higher ground from which the Russians could observe Dalny, and which, if captured, would allow the Japanese to overlook the Russian positions.

The detachment of the First Division attacked and occupied the heights west and south of Pantao.

The Eleventh Division attacked in three detachments; the right moving on the heights east of Lannichiao, the center on the heights called Kensan, or Sword Hill, by the Japanese, the left on Shuangtingshan.

The main resistance to this advance was at Kensan, held by one battalion with a number of machine and quick-firing guns, which was captured by the Forty-third Regiment only after a

stubborn fight lasting until about 5 p. m. The Japanese captured two 6 cm. quick-firing guns and some 200 shells.

As a result of the advance, the Japanese first line extended from Antzushan through the heights about 1 kilometer west of Pantao, Kensan, and Shuangtingshan.

By June 30 the Russians extended their defensive works in the neighborhood of Antzuling from the southern extremity of the heights to the summit of Kabutosan, and had constructed works on the heights north and south of Wangchiatun. They also continued to strengthen the works at Shuangtaikou, where one or more searchlights had been installed.

On July 3 the Russians began a series of attacks that extended through three days. Shortly after noon two companies attacked in the direction of Kensan. About 4.30 p. m. these companies were reenforced and made an attack on Kensan, but were repulsed. About 5.20 p. m. 4 guns took up a position west of Tashihtun and covered the withdrawal of the infantry. About 8.30 p. m. a battalion attacked from the direction of Taposhan, but was repulsed by a counter attack. The Russian force in this vicinity consisted of about 2 battalions, 12 field and 2 machine guns.

A small force of infantry also advanced toward Laotaoshan at 6 a. m., and began skirmishing with the Japanese outposts, driving the latter back between 1 and 2 p. m. About 3.50 p. m. a small force began to advance along the valley north of Laotaoshan, but came under the fire of a Japanese battery and retired. About 6.30 p. m. a battalion deployed south of Laotaoshan and opened fire. A few minutes later 4 guns took up a position north of Laotaoshan and opened a telling fire on the left of that portion of the Japanese position. The Japanese artillery replied and the firing continued until after dark.

On July 4, at 5 a. m., a small force of Russian infantry drove back the Japanese patrols in and north of Wuchia-yingtzu. About 9 a. m. another force opened fire from a hill about 2,000 meters south of Chakou, while yet another force on a hill north of that village opened fire on the Japanese positions west of Pantao; this fire continuing during the day. South of these detachments was another Russian detachment throwing up trenches, about 1,500 meters southeast and east of Nanchakou.

Between 1 and 2 a. m. a small force of Russians made an attack on Kensan. At 6 a. m. the attack was renewed on Kensan and the heights about 3,000 meters to the southeast, the attacking force being increased to about 1 battalion of infantry, assisted by the fire of a battery in the valley west of Wangchiatun. By 7 a. m. the attacking force, increased to about 3 battalions, had approached to within 800 meters. Several unsuccessful attempts to assault were made between that time and noon, at which time the attacking force had increased to 7 battalions, while 2 more battalions were attacking Kensan from the west. At 3.50 p. m. the Russian artillery increased its fire and the infantry again took up the assault with a force of about 10 battalions. So strong was the assault that the general reserve was sent forward and placed under the orders of the commander of the left wing (Eleventh Division), while 3 batteries of heavy guns, just arrived, were pushed forward to Pantao and two others to Huangnichuangtashantun. The heavy naval guns also participated in the fight on this part of the field, which continued during the night.

In the meantime heavy fighting had been going on still farther south. At 6 a. m. the Japanese artillery opened fire on the Russian positions on the north crest of Laotaoshan, to which the Russians, after attempting to reply with artillery fire, replied by advancing the infantry from these positions in an attack on the Japanese line. At 11.30 a. m. the Japanese were compelled to send their reserves into the firing line. At 5 p. m. the Russian artillery on Laotaoshan again opened fire, which was joined in by a Russian vessel off Hsiaopingtao.

On the morning of July 5 the Russians made a couple of demonstrations against the Japanese in the neighborhood of Pantao. At 10.30 a. m. a company of Japanese infantry attempted to seize a small height southwest of Kensan, but was repulsed. Shortly after noon the Russians made a demonstration against Kensan.

At the end of the three days' fighting the Russians held a fortified line through Shuangtaikou, Antzuling, and the heights east of Lungwang River.

The Japanese held one line from near Antzushan to the crest of the heights northeast of Hanchiatun, to a point 2,000

meters southeast of Lannichiao, and another from the high ground south of Lannichiao, via Kensan and Huangnichuang-tashantun, to Shuangtingshan.

On July 7, 8, 12, 17, 18, and 22, there were small reconnaissances by the Russians. On July 10 the Japanese established on the heights east of Lannichiao a battery of 12 guns that had been captured at Nanshan, and a battery of 6 heavy naval guns about 1,500 meters west of Chuchuantzukou.

By July 23 the Ninth Division had completed its landing, begun by the main portion at Dalny about the 15th, and had joined the First and Eleventh Divisions, taking the center of the line. The First Kobi Brigade had landed and joined the First Division.

At 7.30 a. m., on July 26, the Japanese began a general attack in which the Russian artillery maintained the ascendancy. However, the Japanese infantry moved forward about noon, and at dark the First Division had advanced nearly to Yingchengtzu, the Ninth Division nearly to Pienshihpentzu, and the Eleventh Division nearly to Taposhan.

At 6 a. m., on the 27th, the Japanese artillery again opened fire, and the First and Ninth Divisions advanced on the salient, whose apex was Ojikeisan. The Russian fire was withheld until their opponents were within close range. A portion of the assaulting infantry was protected from frontal fire by the steepness of the ground, but was subjected to a severe flank fire from other portions of the Russian position and suffered severely. After repeated assaults a portion of the salient was captured about 3 p. m., but the Russians continued to hold the remainder.

The attack of the Eleventh Division on the heights east of the mouth of Lungwang River was not only stubbornly resisted by the defenders, but the assailants were subjected to the fire of several Russian vessels near Lungwangtang. An assault was made about 5 p. m. but failed. Another assault was begun from three sides shortly after midnight and the hill carried about 5 a. m. on the 28th.

The attack of the First and Ninth Divisions was resumed at dawn of the 28th, and at 9 a. m. the Russians began to withdraw. By night the Japanese had occupied a line through Tungchanglingtzu and Yingkoshih, having captured 2 heavy, 3 field, and 3 machine guns.

On July 30 the Japanese again advanced, the First Division southwest along the Port Arthur road, the Ninth toward Kantashan, the Eleventh toward Takushan. By 11 a. m. they occupied a line from the heights south of Tuchenztzu to those east of Takushan. Hsiaokushan and Takushan remained in the hands of the Russians, who, at other points, had withdrawn across the road leading through Lichiatus.

The Japanese estimate the Russian killed and wounded from July 26 to 30 at about 1,500. An unofficial statement places the Japanese loss at 670 killed and 3,334 wounded, including 25 officers killed, one of which was a colonel of artillery, and 116 wounded, one of which was a colonel of infantry.

On August 1 and 2 the Russians bombarded the Japanese and made several attacks but did not succeed in recovering any ground.

On August 7 the Japanese began a bombardment of Takushan at 4 p. m. At 7.30 p. m. the Eleventh Division, during a high wind and heavy rain, attacked the heights, and at midnight succeeded in occupying the foothills of Takushan. On the morning of August 8 seven Russian vessels approached Yenchang and by a flanking fire greatly aided the Russian force. In the afternoon the Japanese artillery drove the vessels away and resumed the bombardment of the Russians remaining on Takushan. Toward evening the Japanese infantry again attacked and succeeded in occupying the summits about 8.30 p. m. The Japanese loss was about 1,400 killed and wounded.

Continuing the attack during the night, the Forty-third Regiment and part of the Twelfth occupied Hsiaokushan at 4.30 a. m. on August 9. Both Takushan and Hsiaokushan were severely bombarded by the Russians shortly after noon on the 9th, the vessels again appearing off Yenchang and taking part in the bombardment; at 1.30 p. m. a Russian battalion attacked the two heights. The engagement lasted until night and the Japanese suffered severely, but succeeded in holding their positions. The Russian vessels were finally driven into the harbor by some vessels from the blockading squadron.

During the day the Japanese naval battery bombarded

Port Arthur and the harbor, sinking one vessel and striking the *Retvizan*.

In the early morning of August 10 the Russians opened a severe fire from the forts south of Tungchikuanshan. Otherwise the 10th, 11th, and 12th passed with only the ordinary exchange of gun fire. On the 10th the Japanese again endeavored to reach the Russian battle ships in the western harbor with the fire of the naval battery, but did not succeed in striking any of the vessels.

On August 13 a Russian advance post set fire to and evacuated Wuchiafangtzu.

On August 14 the First Division attacked and succeeded in advancing to a line extending from Kantashan to the heights west of Suichiatus via the high ground north of Suichiatus. The attacking force was compelled to retire by the Russians, who were aided in their counter attack by the fire of their batteries on the heights between Hsiaotungkou and Nienpankou. The Japanese again approached during the night, and on the morning of the 15th again attacked and at 11 a. m. succeeded in making a lodgment on these heights.

The conclusion of this attack left the Japanese in front of the land defenses proper of Port Arthur. These defenses, divided into eastern and western sectors by the valley through which the railway enters the town, consisted of permanent masonry forts whose gorges were connected by the old Chinese Wall, temporary works constructed just prior to and during the siege, and connecting and advance trenches. The west sector followed an irregular crest, with an elevation of about 500 feet, around the new town and terminated on Laotiehshan, the highest point in the vicinity, with an elevation of about 1,000 feet. The east sector encircled the old town at a distance of from 2 to 2½ miles, running along an irregular crest, about 350 feet in elevation, within which was an elevation (Wangtai or Signal Hill) of about 800 feet. The permanent forts were polygonal in trace and had ditches with caponiers and galleries. The gap between the two sectors was covered by the fort on Paiyushan (Quail Hill).

Of the works most intimately connected with the siege the Sungshushan, Erhlungshan, North and East Tungchikuanshan, Itzushan, and Antzushan forts were strong, permanent

fortifications. The two Panlungshan forts, East and West, were semipermanent, redoubt-shaped fortifications. 203 Meter Hill and Akasakayama were semipermanent works, with two lines of advance trenches. Kuropatkin Fort was a strong fieldwork, with deep ditch; the Shuishihying lunettes were also provided with ditches, but not so deep. P., H., Kobu, and Hachimakiyama were more in the nature of semipermanent trenches with bombproofs. *new sketch*

On August 16 the Japanese sent, by Major Yamaoka, a note, under a flag of truce, demanding the surrender of Port Arthur and inclosing an offer to allow the noncombatants, such as women, children, priests, diplomats of neutral countries, and military attachés, to proceed to Port Dalny.

On August 17 the Russian refusal to surrender was sent to the Japanese. The offer to noncombatants was not accepted. *band of*

On the morning of August 19 the Japanese began a general attack. The First Division attacked and effected a lodgment on 174 Meter Hill and Namakayama, where it was twice counter attacked in the afternoon and driven back. The Third Regiment carried one of the Shuishihying lunettes, but was unable to hold it. The Ninth and Eleventh Divisions, acting together, advanced and passed the night on a line from north of Wuchiafangtzu through the heights north of Wangchiatun to the western foot of Hsiaokushan.

On August 20 the First Division and First Kobi Brigade completed the occupation of 174 Meter Hill, the First and Fifteenth Regiments making the assault. The Ninth and Eleventh Divisions were unable to make any progress, not only on account of the Russian fire, but also because of the extensive wire entanglements in front of Panlungshan and North Tungehikuanshan. They did make some progress in the destruction of the entanglements. Troops of the Thirty-sixth Regiment entered Kuropatkin Fort after severe fighting, but were driven out shortly afterwards.

On August 21 troops of the Ninth Division, reenforced by the Fourth Kobi Brigade, charged East Panlungshan Fort in the early morning, but were repulsed. Troops of the Eleventh Division at the same time charged North Tungehikuanshan Fort and succeeded in capturing an advanced work 200 meters farther to the southeast. They were subjected

to such a severe fire from the neighboring forts that they were driven from the advanced work about 9 a. m. The Russians made a counter attack north of Shuishihying, but were driven back.

The attack was continued on the 22d. At 9 a. m. the Sixth Brigade, Ninth Division, had captured a portion of East Panlungshan Fort when they came under a severe fire from West Panlungshan Fort. Two companies, sent forward from the reserve during the afternoon, assaulted and, after a severe fight, drove the Russians from the latter fort. This indirectly aided the troops attacking the east fort, from which the Russians were driven shortly afterwards. The Russians attacked both of these forts several times during the night, drove the Japanese down the slopes, and were in turn driven back by the Japanese who succeeded in holding the parapets and keeping the Russians in rear of the gorges.

On the 23d the Ninth and Eleventh Divisions made a night attack on the height (II) northwest of Wangtai, Wangtai and North Tungehikuanshan Fort. A portion of the Ninth Division succeeded in reaching the heights northwest of Wangtai. This attack was met, about 11 p. m., by a strong sortie in the neighborhood of Panlungshan, in which the Russians drove back those Japanese who had crossed the Chinese Wall behind the Panlungshan forts at the foot of Wangtai and passed beyond the line of forts. After severe fighting the sortie was repulsed, the Japanese retaining possession of the Panlungshan forts. While this sortie was in progress troops of the First Division attacked Itzushan Fort, but were repulsed with heavy loss.

On August 24, in the early morning, the Ninth Division continued the attack on the height northwest of Wangtai, while the Eleventh Division attacked Wangtai and North Tungehikuanshan forts. Both attacks failed and may be said to conclude the general attack, begun on August 19, which is said to have cost the Japanese over 15,000 in killed and wounded.

On August 28 the Russians began strengthening the Chinese Wall and the works in the neighborhood of Wangtai, mounting two heavy guns and bringing up field guns to fire on the two Panlungshan forts, now held by the Japanese.

On August 29 the Russians began firing with these heavy guns against the two Panlungshan forts and, about 11 p. m., a small force made a sortie against the west fort, but was repulsed. (34 *apit. p. 31*)

On September 2 the First Division opened a heavy fire on Port Arthur with its field and naval guns. The Russians continued their daily bombardment of the two Panlungshan forts. They continued this bombardment on the next day and destroyed the greater part of the works the Japanese had constructed there. The bombardment was continued daily and was particularly violent on September 6, resulting in the demolition of the works that had been again constructed by the Japanese.

Toward midnight of the 6th a small party of Russians made a sortie against the extreme right of the Japanese line, but was repulsed. Another small party made a determined sortie against the Japanese center and, although finally driven back, completely demoralized the siege operations of the Japanese in that vicinity. (35 *apit. p. 31*)

On September 8 the Russians directed a desultory fire against the Panlungshan forts and a more vigorous fire against the sapping operations, making several sorties against the same at night.

By September 9 the Japanese approaches had reached to within 50 meters of Kuropatkin Fort and 300 to 400 meters of the two Tungchikuanshan forts. By the 11th of September the Japanese approach had reached to within 70 meters of the forts south of Shuishihying. These approaches were fired on daily by the Russian artillery. (36 *OTH p. 55*)

On September 12 small parties of Russians made two sorties against the approach to North Tungchikuanshan Fort, but were repulsed. Other sorties were made as follows: On September 13 near Shihchiao; on the 15th against the approaches to Kuropatkin, Shuishihying, and Hachimakiyama (east of Erhlungshan) forts; on the 16th two against the approach to Kuropatkin Fort, and on the 18th against the approach to the Shuishihying forts. All these sorties were made by small parties consisting of from 40 to 70 men, and toward the end the use of hand grenades by the Russians began. (37 *Kuhn p. 124*) *assault*

On September 19, about 2 p. m., the Japanese opened fire

with their siege and naval guns. Toward the evening the fire was concentrated on Kuropatkin Fort, the Shuishihying lunettes, Namakayama, and 203 Meter Hill. The attack was then begun and continued all night. Troops of the Ninth Division attacked Kuropatkin Fort while troops of the First Division and the First Kobi Brigade attacked the other points mentioned. The Japanese carried Kuropatkin Fort at dawn of the 20th, the Shuishihying lunettes about noon, and Namakayama with its two works about 6.30 p. m. At 8 p. m. one company effected a lodgment on the northwest slope of 203 Meter Hill and about midnight the southwest summit of the hill was carried. The fire from Antzushan and Itzushan forts compelled the Japanese on Namakayama to withdraw from the plateau to the upper trench. (29 W.M., p. 168)

The Russians reinforced their troops on 203 Meter Hill, and desperate fighting was continued until the evening of September 22, when the Japanese were compelled to withdraw from the hill, having lost about 2,500 killed and wounded.^a General Yamamota, commanding First Brigade, was among the killed. (31 G.M., p. 32)

At about 8.30 p. m. on September 25 the Russians concentrated a strong fire against the approach northeast of Erhlungshan Fort and a body of about 30, covered by the rifle fire of about 100 of their comrades, made a determined attack, the fight lasting for about thirty minutes and the opponents coming to hand to hand encounter. The Russian party left 20 killed before it retired. (10 G.M., p. 62)

In the early morning of September 27 the Russians concentrated a severe fire on the approach northeast of Erhlungshan Fort and made two sorties against the same.

From September 28 the fire of the siege and naval guns was directed daily against the Russian vessels in the harbor; the *Peresviet*, *Poltava*, and *Pobieda* were struck several times. (41 G.M., p. 125)

On October 2 the Russians made a strong sortie against the approaches to the Tungchikuanshan forts, which began about 7.30 p. m. and continued until after midnight, when the sortie

^a From the 1st of June to the 30th of September the besieging army is said to have lost 23,500 killed and wounded, 20,000 from beriberi, and 5,000 from typhoid and dysentery.

was repulsed. At the same time a battalion made a sortie against the right of the Japanese siege line, but retired after an engagement of about one hour.

On October 4 a party of Japanese attacked a Russian position south of Yenchang, dismantled a 47 mm. quick fire and a machine gun that had been harassing the working parties in the approaches, and returned to its position at the foot of Takushan. During the night the Russians made several sorties against the approaches to Erhlungshan. (42 Oct. p. 167)

On October 7 the Japanese reported that in the bombardment they had maintained from the 1st to 7th with their siege and naval guns the siege guns hit the *Pobieda* once, the *Retvizan* four times, and the *Poltava* five times; also that several vessels were hit by the naval guns; that the crew of the *Poltava* was landed on the 6th, that of the *Retvizan* on the 7th. (43 Oct. p. 31)

On the night of October 10 the Russians made several sorties against the two Panlungshan forts. They also continued their nightly practice of throwing grenades into the approaches to Tungchikuanshan Fort. The grenades were first thrown by hand. Later the Russians made use of a wooden gun for the purpose and the Japanese resorted to the same expedient.

On the afternoon of October 11 nine Russian torpedo boats twice reconnoitered off Yenchang, exchanging fire with the Japanese torpedo boats and batteries, and retired to the harbor. (44 Oct. p. 171)

At 7 p. m. on that day three companies of Japanese infantry captured the railway bridge south of Lungyen and intrenched at a point 200 meters farther to the front.

On October 12 to 15 the siege and naval guns continued firing at the vessels in the harbor and succeeded in setting the *Peresviet* on fire, causing the vessel, in the opinion of the Japanese, to lose her fighting capacity. On the night of the 12th the Russians threw over 50 grenades into the Japanese trenches. (45 Oct. p. 33)

On October 16, about 4.30 p. m., the Ninth Division attacked and captured the Russian trenches on the glacis of Erhlungshan and entered Hachimakiyama Fort (east of Erhlungshan Fort). The Russians retained possession of the gorge and converted it into a defensive work. The Japanese

captured 1 field gun, 1 small caliber gun, 2 machine guns, some rifles and a quantity of ammunition. (462 p. 31)

In the early morning of October 17 a small force of Russians made a sortie from 203 Meter Hill and threw grenades into the Japanese trenches. About the same time sorties were made in the direction of Hachimakiyama and from Erhlungshan.

For several days the Japanese kept up a desultory bombardment covering their siege operations, which were obstructed by the Russians, who resorted to small sorties, hand grenades, and bombs thrown by wooden guns. By October 23 the approaches were within 50 meters of North Tungchikuanshan Fort; on the 24th they were within the same distance of Erhlungshan Fort. On the 23d the Russians, who had been countermining from North Tungchikuanshan Fort, blew up the head of the Japanese tunneled approach. (47 Kaula P. 115)

On October 25 the Japanese naval guns sank a two-funnel three-mast ship in the harbor.

On the morning of October 26 the Japanese began with their siege and naval guns a heavy bombardment of the Sungshushan, Erhlungshan, and Tungchikuanshan forts. From 2 p. m. the bombardment was extended to the trenches on the glacis of Sungshushan and Erhlungshan forts and the trenches south of Hachimakiyama Fort. At 5 p. m. a force from the First Division attacked Sungshushan and a force from the Ninth Division attacked Erhlungshan and the trenches south of Hachimakiyama. The attacking forces occupied the trenches on the glacis of Sungshushan and Erhlungshan and those south of Hachimakiyama. The attack was then subjected to a severe fire from not only the batteries of the neighboring heights, but also from those of Taiyangkou, Mantoushan, Golden Hill, and Paiyushan. The Japanese reported that this bombardment inflicted no material loss on their army. During the attack the Russians exploded a large mine in the glacis of the Erhlungshan Fort, but the effect of the explosion was unimportant. (480 H. P. 72)

The Japanese continued their bombardment during the night and the Russians made several small sorties from Sungshushan and Erhlungshan forts.

The bombardment of the Japanese on the 27th destroyed or severely injured 1 gun carriage, 3 large guns, and 2 machine guns in the Erhlungshan and Tungchikuanshan forts. On the 28th it caused the explosion of a magazine in North Tungchikuanshan and injured 2 guns in East Tungchikuanshan Fort, and 2 in Itzushan. Fires were also started in Port Arthur. (49 O H A. 73)

During the night of the 28th the Japanese sappers and miners resumed their work against the counterscarp gallery in the eastern corner of North Tungchikuanshan Fort, against which they had exploded a mine the preceding night, and exploded two more mines, making a large breach and killing a dozen of the Russians who were occupying the gallery. They also exploded a mine at the head of their approach to Erhlungshan Fort and destroyed a portion of the counterscarp. (50 O H A. 73)

On October 29 a party of about 100 Russians made a sortie before daylight against the approach to Erhlungshan Fort. At the same time a similar party made a sortie against the tunneled passage to Sungshushan Fort and after a desperate struggle drove the Japanese out. About 2 p. m. the latter attacked and recovered the passage. (51 *memoir* p. 126)

On this day the naval guns were directed against Hsitaikyankou, Antzushan, Itzushan, Paiyushan, and Sungshushan forts, blowing up the magazine at Hsitaikyankou. They also fired on five mine-removing boats in West Harbor, causing fires to break out on two of them.

On October 30 the Japanese began a heavy bombardment in the early morning and at 1 p. m. began a general attack, which was particularly directed against the Sungshushan, Erhlungshan, and North Tungchikuanshan forts. Troops from the First and Ninth Divisions succeeded by sunset in occupying the glacis of the Sungshushan and North Tungchikuanshan forts and in destroying a number of side defenses.

A portion of the Ninth Division carried P. Fort (between Panlungshan and North Tungchikuanshan forts) at 2 p. m. and began to entrench. The Russians made a determined attack against these troops and drove them out about 10.30 p. m. The Japanese, personally led by Major-General Ichinohe, Sixth Brigade, Ninth Division, again attacked and recaptured the fort about 11 p. m., taking 3 guns, 2 machine

(52
Wood
P. 178)

guns, and other spoils. The Japanese renamed the fort Ichinohe. (53 cpw p. 36)

Troops from the Eleventh Division attacked the north and east forts of Tungchikuanshan and the adjacent fieldworks, but were repulsed after having partly carried Kobuyama (an intrenched height north of East Tungchikuanshan Fort) and the trench on the glacis of the east fort.

On the 31st the Eleventh Division again charged North Tungchikuanshan Fort, but was repulsed.

On the night of the 31st the Russians made a small sortie against the extreme right of the Japanese line.

During the day the fire of the Japanese heavy and naval guns injured the *Gilyak*, sank two steamers in the harbor, and started a conflagration near the wharf. On November 1 it sank two steamers, and on the 2d one. (54 cpw p. 36)

On the 3d it started a conflagration near East Harbor, which lasted until the next morning, injured the guns in the gorge of North Tungchikuanshan Fort, and damaged the fieldwork at H., northwest of Wangtai.

On the 6th it caused the explosion of a magazine at the Old Sungshushan Fort.

The month of November was by the Japanese devoted mostly to sapping and mining operations and bombardment of the Russian vessels in the harbor. The Russians resisted the sapping and mining operations by occasional sorties of small parties. The approaching exhaustion of their artillery ammunition caused a falling off in the action of this arm and left the Japanese artillery greater freedom of action. (55 cpw p. 36)

On November 17 the Japanese destroyed the counterscarp galleries of Sungshushan Fort, and completed the occupation of its counterscarp on the next day. On the 19th a powder magazine near the arsenal was exploded by a Japanese shell. The Russians made a determined but unsuccessful sortie from Erhlungshan Fort. The Seventh Division, landed at Dalny the preceding day, began to arrive.

On November 20 the Japanese exploded three mines, blowing in the counterscarp and partly filling the ditch of Erhlungshan Fort.

On November 21 the Japanese attempted an assault on North Tungchikuanshan Fort, which failed. A counter attack of the garrison was repulsed. (56 cpw p. 36)

On November 23 troops of the Eleventh Division captured the trench on the northern glacis of East Tungchikuanshan Fort, but were driven out early in the morning of the 24th.

On the afternoon of November 26 the Japanese began a general attack on the Sungshushan, Erhlungshan, and Tungchikuanshan forts. The storming parties were driven back, but the assault was continued. (57 OH p. 86)

On the night of November 26 a force of about 2,500 men, drawn from all four divisions and commanded by Major-General Nakamura, made an unsuccessful assault on the works running southwest from Sungshushan Fort (Sungshushan supporting fort). The attack was disclosed by the Russian searchlights and subjected to a heavy fire, which, however, did but little damage. This attack ceased about 2.30 a. m. on the 27th, after severe hand to hand fighting, and cost the Japanese nearly one-half of the attacking force.

The general attack, which was very desperate on the 26th and 27th, continued on a lesser scale until December 2, when a partial armistice was entered into on the eastern front for the recovery of the killed and wounded. (58 OH p. 88)

The loss suffered by the Japanese has been estimated as high as 12,000 killed and wounded. Lieutenant-General Tsuchiya, commanding Eleventh Division, Major-General Saito, commanding the Fourteenth Brigade, Seventh Division, and Major-General Nakamura were among the wounded.

On November 28 troops of the First Division and the First Kobi Brigade began an attack on 203 Meter Hill and Akasakayama. Both sides resorted to hand grenades, in the use of which the Japanese were at a disadvantage, on account of the higher elevation of their opponents. In addition, the assault was subjected to fire from Sungshushan and failed at Akasakayama. A small party reached the crest of the southwest peak of 203 Meter Hill, was driven a short distance below the crest, and then succeeded in holding on until an approach could be constructed through which they could be reenforced. (59 Kuhn p. 131)

On November 30 the Japanese brought forward their wooden guns and began bombarding the summit. The force holding the advance on the southwest peak was reenforced by one company and advanced to near the crest where a high

wall of sand bags was constructed. The First Regiment attacked and finally occupied the Russian trenches on the slope of Akasakayama, but evacuated them shortly afterwards on account of being fired on by their own artillery.

Troops from the Twenty-sixth, Twenty-seventh, and Twenty-eighth Regiments assaulted the northeast peak of 203 Meter Hill, carried the Russian trenches on the slope, and endeavored to reach the crest, but were driven back to the trenches. (60 Kuhn p. 135)

On December 1 troops of the Seventh Division again assaulted 203 Meter Hill, one party passing over the crest of the southwest peak and clearing a portion of the summit, and were again repulsed. The Japanese holding the trenches on the slope of the northeast peak were also driven out. (61 Kuhn p. 135)

During December 2, 3, and 4 the Japanese restricted their action to bombarding the Russian positions and to constructing an approach up the northeast peak of 203 Meter Hill. On the morning of the 5th the fire of the Japanese artillery was increased. About 3 p. m. eight battalions of the Seventh Division, under Major-General Saito, advanced against the northeast peak and, in conjunction with the reinforced troops holding the crest of the southwest peak, carried all of 203 Meter Hill. (62 Kuhn p. 135)

The capture of 203 Meter Hill allowed the Japanese to bring on Akasakayama a plunging fire which, accompanied by demonstrations, caused the Russians to evacuate that height on December 6 and to withdraw from the trench leading toward Itzushan. It also gave an observation point covering both harbors and enabled the fire of the heavy siege and naval guns to be directed upon the Russian war ships in the harbor. On December 9 the *Sevastopol* anchored outside the harbor under shelter of Tiger's Tail Peninsula, but was subsequently torpedoed by the Japanese and sunk in deep water by her own commander. The other large vessels by that time had been crippled by the Japanese fire and scuttled by the Russians to protect them as much as possible from the Japanese fire. (63 O'H p. 102)

On December 18, at 2.30 p. m., the Japanese exploded mines under the parapet of North Tungchikuanshan Fort. The Twenty-second Regiment then charged the fort, but halted in the crater. About 7.30 p. m. two companies of

the Thirty-eighth Kobi Regiment entered through the breach, and by midnight the fort was completely occupied, the Japanese capturing five 87-mm. field guns, two 74-mm. quick-fire guns, two 24-mm. guns and 4 machine guns.^a (64 OH 15103)

On December 22, 23, and 24 the Japanese attacked and carried some small Russian positions near the northern arm of Pigeon Bay and thus advanced their right so that it ran from 203 Meter Hill through Luchiatum to Pigeon Bay.

On December 28, at 10 a. m., the Japanese exploded mines under the parapet of Erhlungshan Fort and an assaulting force from the Ninth Division reached the crater and intrenched. At 4 p. m. the Nineteenth and Thirty-sixth Regiments resumed the assault and reached the interior of the fort. The remainder of the garrison was finally driven back from the defense of the gorge, and at 7.30 p. m. the Japanese had possession of the entire fort with its armament of 4 heavy guns, 7 guns of smaller caliber, thirty 37-mm. guns and 2 machine guns. The fighting during the capture of the fort was severe, the Japanese losing about 1,000 killed and wounded. (65 Kuhn p. 141)

On December 31 the Japanese exploded mines under the parapet of Sungshushan Fort, the explosion extending to the magazine. Troops from the First and Seventh Divisions then assaulted and drove out the remnants of the garrison, capturing with the fort and its armament 2 officers and 160 men who had been imprisoned in the galleries by the explosion. (66 Kuhn p. 141)

On January 1, 1905, in the early morning, the Japanese drove the Russians from the new Panlungshan Fort and II. work. At 3 p. m. a small force of Japanese reached the summit of Wangtai, but was driven back by the Russians, who then set fire to the wooden structures of the work and withdrew. The Japanese again occupied the summit, losing some of their men through the explosion of the magazine or a Russian mine. (67 Kuhn p. 142)

At 9 p. m. General Nogi received from General Stoessel a letter proposing to hold negotiations with reference to capitulation.

^a It was in this fort that General Kondratchenko and 8 other officers were killed by a bursting shell on December 15.

Both belligerents appointed plenipotentiaries, who completed their negotiations at 4.30 p. m. on January 2, and both armies suspended hostilities.

By the terms of the capitulation all Russian soldiers, marines, and civil officials of the garrison and harbor were made prisoners; all forts, batteries, vessels, munitions, etc., were transferred to the Japanese in the condition in which they existed at noon on January 3, and all public property, such as buildings, munitions of war, etc., were to be left in position, pending arrangement for their transfer. Officers of the army and navy were permitted to retain their side arms, and, upon signing a parole not to take arms during the continuance of the war, return to Russia. Noncommissioned officers and privates were to be held as prisoners.

The organizations taking part in the defense of Port Arthur are shown in the following tables of prisoners transferred:

LAND FORCES.

Organization.	Officers.	Men.
<i>January 5, 1905.</i>		
5th East Siberian Rifle Regiment	36	1,547
13th East Siberian Rifle Regiment	38	665
14th East Siberian Rifle Regiment	32	882
15th East Siberian Rifle Regiment	50	1,353
16th East Siberian Rifle Regiment	30	1,001
	186	5,451
<i>January 6, 1905.</i>		
25th East Siberian Rifle Regiment	42	1,432
26th East Siberian Rifle Regiment	40	1,420
27th East Siberian Rifle Regiment	58	2,178
28th East Siberian Rifle Regiment	52	1,505
7th Reserve Battalion	14	282
3d Reserve Battalion	12	308
10th Regiment Staff	2	66
11th and 12th East Siberian Regiments	4	195
4th Artillery Brigade	26	901
Garrison artillery	2	113
Kuantung garrison artillery	68	2,783
Gendarmes	2	24
	322	11,207
<i>January 7, 1905.</i>		
Staff of General Stoessel	9	39
Staff of Kuantung commander-in-chief	6	15
Engineer Company	11	269
Telegraph Corps	4	60
Railway Corps	1	155
Cavalry	4	177
Field, post, and telegraph offices	33	23
	68	738
Total land forces	576	17,396

NAVAL FORCES.

Organization.	Officers.	Men.
Crew of—		
Retvizan.....	22	446
Pobieda.....	22	510
Pallada.....	11	208
Peresviet.....	15	607
Poltava.....	16	311
Sevastopol.....	31	507
Bayan.....	15	259
Bober.....	12	99
Strodevai.....	4	52
Otvazhni.....	6	124
Gilyak.....	5	72
Amur.....	7	173
Naval defense headquarters.....	3	3
Harbor office.....	60	29
Naval brigade.....	59	2,531
Torpedo brigade.....	10	142
Total naval forces.....	298	6,073
Land forces.....	576	17,396
Total transferred to include Jan. 7.....	874	23,469

In addition to the above there were about 3,000 noncombatants transferred and about 16,000 sick in hospital. The total number of prisoners, including sick, wounded, and prisoners was given at 41,641.

Russian figures, not official, place the original garrison (including naval contingent) at 54,000; killed and died during the siege, 15,000; taken prisoners, 21,000, in addition to 18,000 sick, of whom 6,000 were wounded.

The composition of the Third Japanese Army, when completed, was as follows:

Organization.	Commander.	Chief of staff.	Bri- gade.	Commander.	Regiment.
1st Division.....	{Fushimi, Mat- sumura.	Yoshino.....	{2d..... 1st.....	Nakamura.... Yamamoto, Baba.	2d, 3d, 1st, 15th.
7th Division.....	Oseko.....	Ishigomo.....	{13th..... 14th.....	Yoshido..... Saito.....	25th, 26th. 27th, 28th.
9th Division.....	Oshima II....	Adachi.....	{6th..... 18th.....	Ichinohe..... Mayeta, Hi- rasa.	7th, 35th. 19th, 36th.
11th Division.....	{Tsuchiya, Samejima.	{Ishida..... Saito.....	22d..... 10th.....	Kamio..... Yamanaka...	43d, 12th. 44th, 22d.
1st Kobi Brigade.....				Takinouchi, Oki.	1st, 15th, 16th.
4th Kobi Brigade.....				Tomogasu, Yakanachi.	8th, 9th, 38th.
Artillery Brigade (72 guns).				Nagata.....	
Naval Brigade (1,200 men).				Kuroi.....	
Fortress Artillery (3 regiments, 1 bat- talion, 2 groups).				Teshima.....	

The First Regiment contained 6 field batteries; the Seventh, 2 field and 2 mountain batteries; the Ninth, 6 mountain batteries; the Eleventh, 6 mountain batteries; the Second Artillery Brigade, 12 field batteries.

The total artillery used by the Japanese during the siege is estimated at —

6-inch naval.....	4
4.7-inch naval.....	10
12-pounder naval.....	20
10.5 cm. Krupp.....	4
Bronze guns (Russian).....	30
8.7 cm. (Russian).....	6
Field guns.....	120
Mountain guns.....	84
Total guns.....	278
28-cm. howitzers.....	18
15-cm. howitzers.....	16
12-cm. howitzers.....	28
Total howitzers.....	62
Mortars, about.....	160

The total effective strength at the time of the capitulation may be taken as about 75,000.

The Seventeenth Regiment, Eighth Division, was present at the capture of 203 Meter Hill.

Unofficial reports state that the Eighth (Osaka) Kobi Regiment, as punishment for misconduct on August 23, was withdrawn from the fighting contingent for work on the lines of communication.

General Nogi reported a list of spoils in which the following important items are found: 59 permanent forts and fortifications; 546 guns; 82,670 projectiles; 35,252 rifles; 2,266,800 rifle cartridges; 4 battle ships (not including the *Sevastopol*, which the Russians had sunk in deep water) comprising the *Peresviet*, *Poltava*, *Pobieda*, and *Retvizan*; 2 cruisers, comprising the *Bayan* and *Pallada*; 14 gunboats and destroyers; 10 steamers; 8 steam launches. All the vessels were sunk and in a more or less damaged condition. The battle ships, cruisers, and some of the smaller vessels were, however, subsequently floated by the Japanese.

LANDING OF THE FOURTH JAPANESE ARMY.

On May 19 Rear-Admiral Hosoya, with the *Fuso*, *Heiyan*, *Tsukushi*, *Saiyen*, and other vessels, convoyed transports containing troops of the Fourth Japanese Army to Takushan, and the debarkation began immediately, being unopposed.

At first this army consisted of the Tenth Division under Lieutenant-General Kawamura, with Major-Generals Marui and Tojo as brigade commanders. Subsequently the Fifth Division was joined to the Tenth, forming the Fourth Army, commanded by General Nodzu.

Following two unimportant skirmishes, communication with the First Army was established shortly after landing, and the combined force began working to the west and northwest.

On June 8 a combined detachment from the two armies occupied Siuyen after a skirmish at Tahuling with Major-General Mishchenko's Cossack brigade, which retired toward Tomucheng. On June 18 a reconnoitering detachment sent from Siuyen encountered a Russian detachment in the neighborhood of Chipanling. On June 23 there was a skirmish at Hsienchiayu, on the road to Tashihchiao, and again on the heights north of Santaoho.

FENSHUILING.

(Plate VI.)

On June 26 the Takushan force advanced against the Russians at Fenshuiling in three columns under Colonel Kamada and Major-Generals Asada and Marui. Asada, with his brigade from the Guards Division, proceeded from Yangpankou toward Fenshuiling; Kamada, from Tasangpoyu against the Russian right; Marui, from Tsiehkuanyin by a circuitous route against the Russian right rear. A force under Major-General Tojo was charged with protecting the rear of that under Marui. To do this, Tojo attacked the Russians who were occupying Shanghota and Tungchia-chuang with about 3 battalions, a battery of horse artillery, and 2 machine guns.

The fight lasted all day without advantage to either party, but during the night Tojo again attacked and carried the position, which he occupied and in which he was several

times attacked on the afternoon of the 27th by the Russian force, which had received reenforcements.

General Marui reached Tsiehkuanyin on the night of the 26th, sent a detachment to attack the flank and rear of the Russians who were opposing Tojo, and with his main body advanced at 3 a. m. on the 27th to turn the Russian rear at Fenshuiling. This main body was opposed by two battalions at Erhtaokou, but drove them back about 11 a. m. and reached Santaokou.

Major-General Asada, after driving back a force of Russian infantry and cavalry near Wanchiapu on the 26th, passed the night to the south of Wafantien at the eastern foot of Fenshuiling. At 5 a. m. Asada's artillery began firing on the Russian fortifications, but the Russian artillery, well posted and skillfully handled, maintained the advantage. However, Kamada's force dislodged two companies of Russian infantry from halfway up the Tihungshan.

Asada then posted his guns at this latter place about 7 a. m. and opened fire on the Russian right. Kamada with his infantry then left Tihungshan, moving against the Russian flank and rear.

In the meantime the Fukaya regiment, detached by Asada, attacked at midnight of the 26th and drove two companies of Russian infantry from the heights west of Yangpankou at 7 a. m., and then moved toward the Russian left rear.

This brought the Japanese on three sides of the Russians, who began to withdraw toward Tomucheng about 8 a. m., and Asada's infantry moved forward and occupied the pass at 11.30 a. m.

Besides the pass itself the Japanese captured 88 prisoners, including 6 officers. They lost 75 killed and wounded, including 1 officer, Major Oba, killed. The Russians lost about 200 men.

The capture of Fenshuiling gave to the Takushan army an entrance to the Liao Valley and placed it in a position to quickly cooperate with General Oku, moving up from the south on Kaiping, should such cooperation prove necessary. Such cooperation would, however, expose its right wing to the Russian force now assembled at Haicheng and Liaoyang, but for the operations of the Japanese First Army by which it gained possession of the Fenshui Mountains north of Fenshuiling.

ADVANCE OF THE JAPANESE FIRST ARMY FROM FENG-HUANGCHENG.

In the advance from Fenghuangcheng the Japanese First Army marched in three columns, the Twelfth Division moving on the Saimachi-Liaoyang road, the Second Division on the Lienshankuan-Liaoyang road, the Guards Division to the left of the Second Division and maintaining communication with the Takushan army.

The Second Division, leaving Fenghuangcheng on June 24, reached Hsuliten the same day, Hanchiat'ai on the 25th, and Washosho on the 26th, remaining at the latter place until the 30th for the purpose of arranging an attack on the fortified position at Bunsuling. The Russians, however, on June 27, evacuated Bunsuling and Lienshankuan, and on the 30th the Second Division continued to and occupied Lienshankuan, the advance guard occupying Motienling without resistance. In this position roads were built, supplies brought up, and telegraph lines built connecting the different portions of the First Army.

Moving north on the Saimachi road, the Twelfth Division had a skirmish on the 27th of June with some infantry and cavalry coming from Saimachi. The Russian force at Saimachi retired toward Pensihu and was followed by the Twelfth Division, which thus turned the Russian position at Bunsuling, while the Second Division was approaching it from the south. A detachment of the Twelfth Division moved to the left as far as the Lienshankuan-Liaoyang road, entering Lienshankuan and Motienling on June 29. The line of communications of the Twelfth Division was now Saimachi-Aiyangpienmen-Chongsung-Yalu.

The Third Division, East Siberian Rifles, occupying Lienshankuan, had at Domonsi an outpost of 2,000 men and 6 guns, which withdrew on June 24.

On July 4, in the early morning and in a dense fog, two Russian battalions, one from the Tenth East Siberian Rifles and one from the Twenty-fourth, attacked the Japanese battalion of the Thirtieth Regiment at Motienling, driving the advance picket off the road by a flank attack and penetrating the Japanese line. The attack was vigorously pushed, the opposing troops engaging in a hand to hand combat. Japanese reinforcements arrived, however, and the Russians were forced to retire toward Yangtzuling with

a loss of 53 killed and about 40 wounded. The Japanese lost 19 men killed and 2 officers and 36 men wounded.

On July 5 some Cossacks attacked a Japanese detachment near North Fenshuiling on the road from Saimachi to Liaoyang, but failed to dislodge it and retreated northward after the skirmish.

On July 6 a detachment of Japanese dislodged a body of Cossacks from Hsienchang and occupied the town.^a

With the occupation of Kaiping by Oku, on July 9, the three Japanese armies were united on a front from Kaiping east to Fenshuiling, thence northeast through Motienling, with covering detachments of Kobi troops eastward at Saimachi, Hsienchang, and Huaijen.

The Russians were concentrated in the Liao Valley at Tashihchiao, Haicheng, Anping, and Liaoyang.

On July 6 Field Marshal Oyama left Tokyo to take active command of the Japanese Manchurian army. With him were General Kodama, Chief of Staff, and Major-Generals Fukushima and Inokuchi.

On July 9 the Takushan army sent a column toward Tangchi via the roads leading through Hsienchiayu and Tsiehkuanyin, the two detachments reaching the heights south of these places at 9 and 11 a. m., respectively. The Russians at Hsienchiayu resisted the attack throughout the day; those at Tsiehkuanyin, about two battalions and a battery, retired from their position in the evening. On the morning of the 10th the Japanese drove the Russians from their position west of Hsienchiayu and continued to and occupied the second Russian position on the heights of Hsinchaikou.

On the 10th another force from the Takushan army, advancing from Fenshuiling toward Tomucheng, came into conflict with the Russians and was repulsed, reporting the Russian force south of Tomucheng to consist of about one division.

^aThese Cossack detachments belonged to the division of Lieutenant-General Rennenkampf, who was on the extreme left flank operating on the upper waters of the Taitzu River. Of the completed division the First Brigade, commanded by Major-General Grekov, was composed of the Second Verkhne-Udinsk and Second Chita Regiments, the Second Brigade, commanded by Major-General Linbavin, was composed of the Second Nerchinsk and Second Argunsk Regiments.

SECOND ATTACK ON MOTIENLING.

(Plate VII.)

On July 17 Lieutenant-General Keller, with six regiments of infantry from the Third and Sixth Siberian Divisions and the ninth European Division, a battery of artillery and a small force of cavalry, attacked Motienling and vicinity held by the Second Japanese Division.

In the Japanese forces the Sixteenth Regiment (less one battalion) was at and near Hsiamatang, the Thirtieth Regiment at and near Motienling, the Fourth Regiment at and near Hsinkingling, the remainder of the division in reserve near Lienshankuan.

At 3 a. m. the Japanese advance post in front of Motienling was attacked and driven back. By 5 a. m. the Russian line had reached the ridge west of Motienling and was engaged with the Thirtieth Regiment and one battery in position on the ridge east of Motienling. The Russians reenforced their first line and continued the fight, making several attempts to turn the Japanese left. These attempts were met by sending some detachments to prolong the Japanese left. About 9 a. m. three companies from the Sixteenth Regiment from Hsiamatang reenforced the right of the Thirtieth Regiment and shortly afterwards the Russians in front of Motienling began withdrawing. The Japanese at Motienling, now reenforced by one battalion of the Twenty-ninth Regiment and the greater portion of the Second Cavalry Regiment, followed a short distance, but coming under the fire of a Russian battery from near Lichiaputzu ceased the pursuit about 2 p. m.

About 1 a. m. the outpost of the Japanese Fourth Regiment at Hsinkingling was attacked by two Russian battalions, one coming from the west and one from the north. The Japanese Fourth Regiment repulsed this attack and sent northward a detachment which at 1 p. m. was able to bring a long-range fire on the Russians retiring from Motienling.

The Japanese Sixteenth Regiment at Hsiamatang had outpost companies on the roads leading from that village to the west, the northwest, and the north. About 8 a. m. the company on the road leading to the west was attacked. Three companies of the Sixteenth Regiment, en route to assist the Thirtieth Regiment, joined this outpost company,

assisted in repulsing the Russians, and continued on to the assistance of the Thirtieth Regiment.

The outpost company on the road leading northwest from Hsiamatang, at Shakahoshi, was attacked about 8 a. m. by two Russian battalions and very severely handled, losing all its officers. The fighting continued at this point until about 4.50 p. m., the Japanese company being reenforced by the outpost company from the road leading west and also from the reserve of the Sixteenth Regiment, which had been strengthened by one battalion of the Twenty-ninth Regiment, when the Russians retired.

The company on the road leading north to Hsihoyen was attacked about 11.30 a. m. by a Russian detachment of infantry and cavalry and driven back to near Hsiamatang where it was reenforced by one company of pioneers that had arrived from near Lienshankuan. The Russians withdrew from this attack about 12.30 p. m.

The Japanese reported their losses as 4 officers and 39 men killed; 15 officers and 241 men wounded.

The Russians reported a loss for July 17 to 19 of 8 officers and 215 men killed, 37 officers and 1,069 men wounded, and 2 officers and 224 men missing.

HSIHOYEN.

(Plate VIII.)

General Kuroki's right column (Twelfth Division) moved forward on the Saimachi-Hsihoyen-Anping road on July 18, sending an infantry detachment toward Hsiaotientzu (about 5 miles south of Chinghochen), which was occupied by the Russians.

On arriving at Santaohotzu the column found that Hsihoyen was occupied by the Russians, commanded by General Herschellmann, and sent forward a battalion of the Forty-sixth Regiment to reconnoiter. This battalion encountered at the river a force of about 2 battalions and 8 guns and was forced back a short distance after losing heavily.

About 6.30 p. m. the Japanese battalion was reenforced by the other two battalions of the Forty-sixth Regiment and two battalions of the Twenty-fourth Regiment and continued the fight until dark, and then, being unable to make any headway, bivouacked in position.

The Russian left rested on the Hsi River, while the right rested on the heights, to the southwest of Hsihoyen, rising from 50 to 300 feet above the valley.

From the main body of the Japanese column at midnight on the 18th was sent the Forty-seventh Regiment to watch the road to Pensihu, and the Fourteenth Regiment through the hills to the south against the right of the Russian position. The artillery took up a position in the valley and opened fire at 5 a. m. on the 19th. To this fire the Russians replied with 32 guns. The duel, lasting until 9 a. m., seems to have resulted in favor of the Russians, as no further attempts were made in front until the Fourteenth Regiment made its way through the mountains and, in conjunction with a detachment of 6 companies of the Sixteenth Regiment, Second Division, sent from the neighborhood of Lienshan-kuan, attacked the Russian right about 3 p. m. The Russians withdrew their artillery and presumably a considerable portion of their infantry.

The main Japanese force, Twenty-fourth and Forty-sixth Regiments, which was in position fronting the Russian right, took up the attack, assisted by the fire of its artillery from advanced positions. Both attacks met stubborn resistance. At 5.40 p. m. the main force carried one of the heights to the southwest of Hsihoyen and the attack of the two detachments approached close to the Hsihoyèn-Anping road. The Russian rear guard retired and the Japanese occupied the position about 8 p. m.

The Russian force was reported by the Japanese to consist of the Thirty-fifth Infantry (4 battalions), Thirty-sixth Infantry (3 battalions), the Argunsk Regiment of Cossacks, and 32 guns.

The Japanese reported a loss of 2 officers and 70 men killed and 16 officers and 437 men wounded; also, that they buried 131 Russian dead on July 20, took 2 officers and 45 men prisoners, and captured 3 ammunition wagons, 300 rifles and a large quantity of clothing.

The Russian loss is included in that reported under the second attack on Motienling.

The detachment sent toward Hsiaotientzu encountered a battalion of infantry and about 1,000 cavalry at Chaochiapao,

5 miles south of Hsiaotientzu. After a skirmish of about four hours the Russians retired to the right bank of the Taitzu with a loss of 1 killed and 13 wounded. The Japanese lost 17 men wounded.

PANLING PASS.

On July 21 a Russian detachment, reconnoitering to the south, came into contact with a detachment of the Takushan army in the neighborhood of Panling Pass, and occupied the pass after a skirmish, in which they lost a captain killed and Lieutenant-Colonel Andreiev, commanding the detachment, and 3 soldiers wounded. The Japanese had 2 men killed. About noon on the next day the detachment was attacked from different directions and driven from the pass, which the Japanese occupied. The Japanese lost 1 officer and 8 men killed and 22 men wounded. The Russians lost 14 men killed, 3 captured, and about 30 wounded.

TASHIHCHIAO.

(Plate IX.)

On July 23 General Oku's army left its line of positions near Kaiping and advanced to the line Liuchiakou-Huarushan-Wutaishan, skirmishing with Russian detachments during the advance, particularly in front of the Japanese left. The Fifth Division was on the right, the Third in the center, the Fourth on the left, and the Sixth in reserve. Cavalry from both armies was to the west of the railway.

The Russian "southern forces," commanded by Lieutenant-General Zarubaiev, contained the First, Second, and Fourth Siberian Corps and Major-General Mishchenko's Cossack brigade; a total of about 88 battalions, 32 squadrons, and 172 guns. The First and Fourth Siberian Corps occupied a position south of Tashihchiao, reaching from the railway, near Niuhsinshan, to the small stream flowing south past Tangchi. The Second Siberian Corps, at this time containing only the Fifth Division, was at Tomucheng. The Cossack brigade maintained connection between the two positions.

At dawn of the 24th the Fifth Division attacked in the direction of Taipinling. The Russian artillery, skillfully

placed and handled, maintained a superiority over that of the Japanese.

The Third Division, aided by the fire of its artillery near Huarushan, advanced as far as the heights north of Sunchiatun at 10 a. m., where it was stopped by the Russian artillery posted between Chingshihshan and Wangmatai. The Fourth Division then advanced from Wutaishan, its artillery taking a position near Tapinchuang and engaging in a duel with the Russian artillery near Wangmatai, but soon halted.

Orders were then sent for the Fifth Division to advance regardless of losses, but at sunset it had not succeeded in penetrating the Russian line. The Third Division succeeded in capturing one position, but was in turn driven back by a counter attack.

The artillery fire practically ceased on both sides at sunset, although the Russian artillery fired occasional shots as late as 9 p. m.

The commander of the Fifth Division obtained permission to make a night attack, and about 10 p. m. advanced the greater part of his infantry to near Taipinling and then captured the Erhtaoling position. A second advance was made by the same body, occupying the Taipinling position about 3 a. m. The Third Division moved forward and occupied the heights near Shanhsitao shortly afterwards.

On the morning of the 25th the artillery of the Third Division near Wohungkang opened fire, but received no reply. The infantry from that position then moved forward and occupied Chingshihshan and was followed by the Fourth Division, which moved forward and occupied the line from Niuhsinshan to Chiataipu.

About 11 a. m. the Russian rear guard left Tashihchiao, which was occupied by the Japanese shortly afterwards.

The First Siberian Corps retired along the railway toward Haicheng. The Fourth Siberian Corps retired along the Erhtaoho road and aided the Second Siberian Corps at Tomucheng on July 31.

Lieutenant-General Zarubaiev reported that he had 18 battalions engaged and lost 4 officers and 141 men killed, 30 officers and 646 men wounded, and 3 officers and 107 men missing.

General Oku reported that the Japanese lost 12 officers and 136 men killed, and 47 officers and 848 men wounded.

During the 25th a detachment of Japanese cavalry proceeded to and occupied Yingkou, the Russian garrison having retired to the northeast.

TOMUCHENG.

(Plate IX.)

On July 30 the Takushan army occupied a line from the height west of Tafangshan through that north of Hsiapafankou to south of Kuchiaputzu and southwest of Yinglaoshan.

At dawn on the 31st the main body attacked the Russian position on the heights east of Sanchiaoshan, and the left wing attacked the positions on the heights north of East and West Yangshikou.

By 8 a. m. the Japanese left wing had reached the heights northwest of West Yangshikou, where it was repulsed by the Russians at Erhtaokou. The Japanese left, reinforced by the arrival of the Fifth Division, which was detached from the second army after the battle of Tashihchiaio, resumed the attack and drove back the Russians from Erhtaokou about 3 p. m., capturing 6 guns.

The main column was able to occupy the Russian positions on the heights west of Tapingling at 10.30 a. m., but was compelled to halt there by the fire of the Russian artillery at Changsankou and on the heights east of Hsiaofangshan. The Russians being reinforced, took the offensive on this part of the field about 5 p. m., and drove the Japanese from the positions they had occupied on the heights west of Tapingling.

This counter attack had been ordered by General Zasulich to relieve the pressure on his extreme right, of which he was informed about 3.40 p. m.

During the night the Russians retired toward Haicheng, having lost, as reported by Zasulich, on the 30th and 31st, 29 officers and a little over 1,000 men killed and wounded. The Japanese reported a loss of 8 officers and 186 men killed, 24 officers and 642 men wounded, and the capture of 6 guns and 570 rounds of gun ammunition, 63 rifles, and various other articles.

YUSHULINGTZU.

(Plate VIII.)

On the night of July 30 the two wings of the Japanese First Army moved forward against the Russian East Detachment. The Twelfth Division moved in two columns from the neighborhood Hsihoyen-Peichai, leaving the Kobi Brigade, commanded by Major-General Umezawa, in the Laomuling region to watch the Pensihu district. A detachment from the Second Division, and consisting of the Thirtieth Infantry and one battalion of the Sixteenth, moved from Hsiamatang toward Yushulingtzu in cooperation with the Twelfth Division.

At dawn on the 31st the right column (Kigoshi's brigade) attacked the advanced Russian position, which was about 2,000 yards in advance of the main position on the heights of Lakouling, and carried the same about 8.50 a. m. It then advanced against the main position.

In the meantime the left column (Sasaki's brigade) came into conflict with a force of Russian infantry at Pienling about 6.35 a. m. and the Hsiamatang detachment attacked a Russian battalion at Niaomeiling and drove it back about 8 a. m. In the pursuit of this force the Hsiamatang detachment flanked the Russian force at Pienling and succeeded in obtaining a position from which it opened a galling fire, at distances from 200 to 1,000 yards, upon this force during its withdrawal, inflicting severe loss.

In the afternoon the right column attacked the main Russian position at Lakouling, but was repulsed.

At dawn on August 1 the Russians withdrew from the vicinity and the Twelfth Division advanced to Lakouling.

YANGTZULING.

(Plate VII.)

In the left wing of the Japanese First Army the Second Division, less the Hsiamatang detachment, operated on the Motienling-Anping road. The Guards Division was to the left of the Second, the two divisions moving in conjunction against the Russian position at Yangtzuling.

In the early morning of July 31 a detachment of the Second Division drove in the Russian outpost on the heights east of Tawan and the infantry took up positions for the attack on the heights west of the Lang River. Two batteries took up a position near Chinchiaputzu, but the remainder of the artillery did not succeed in taking up positions until about 11 a. m.

The Guards attacked from the direction of Makumentzu at dawn, sending detachments by various passes to turn the Russian right. In addition to the opposing infantry the attack came under the fire of four Russian batteries posted on the summit of Yangtzuling and neighboring heights. The Japanese artillery was unable to reply effectively and the attack made no progress during the forenoon. The flanking detachments reached the heights west of Hanchiaputzu.

At 10.15 a. m. one battery of the Second Division opened fire but was soon silenced.

Shortly after 2 p. m. the artillery of the Second Division opened fire on Tawan and the heights to its north and some infantry moved forward. A general artillery duel then ensued in which the Russian artillery, posted on the heights north and south of Yangtzuling, had the advantage.

Shortly after 4 p. m. infantry of both divisions attacked near Tawan and Makumentzu. On the right the attack passed beyond Tawan, otherwise but little progress was made. The attack ceased at sunset, the Russians withdrew during the night, and on the morning of August 1 the Japanese moved forward and occupied the Yangtzuling position.

The Russian force at Yushulingtzu comprised the Thirty-first and Thirty-fifth Divisions (later incorporated in the Tenth and Seventeenth Corps, respectively), one brigade of the Ninth Division (later incorporated in the Tenth Corps), and four batteries of artillery. The force at Yangtzuling comprised the Third and Sixth East Siberian Rifle Divisions (Third Siberian Corps), one brigade of the Ninth Division, and four batteries of artillery.

General Kuroki reported his loss in the two engagements as about 900 killed and wounded and the capture of 2 field guns, 500 or 600 rifles, a quantity of ammunition and minor articles, and 8 officers and 149 men.

The Russians reported a loss of 10 officers and 349 men killed, 42 officers and 1,192 men wounded, and 2 officers and 219 men missing.

The Russian commander, Lieutenant-General Keller, was killed at Yangtzuling.

The front of the combined Japanese armies on August 1 was Tashihehiao-Tomucheng-Yangtzuling-Yushulingtzu.

OCCUPATION OF HAICHENG.

(Plate IX.)

On August 1 the Japanese Second Army moved forward along the railway from its positions near Tashihehiao, being opposed by some small rear guards.

The Russian artillery from northeast of Hulukou and from Hiachiaho opened fire on the heads of the Japanese columns at Liangchiaputzu and Nanchinshan, while a horse battery, supported by cavalry, opened fire from Hungwasai. Some Japanese artillery replied from near Tungehiakou and Wenchiahou and a column west of the railway, driving back the opposing infantry and cavalry, advanced and occupied Liuchiaputzu and Lienshantun. The Russian rear guard then withdrew.

On August 2 the Japanese advanced, without serious opposition, to the Pali River, and the Russians withdrew from Haicheng toward Anshantien. On the next day the Japanese occupied Haicheng.

With the conclusion of this advance the front of the Russian forces at and in the vicinity of Liaoyang extended from Anshantien through Lantzushan and the mountain range east of Anping to the Taitzu River.

The Japanese front extended from Haicheng through Tomucheng and Yangtzuling to Yushulingtzu.

On August 6 a Russian force bombarded and burned the village of Kenchuanagtzu, driving back troops of the Japanese First Cavalry Brigade and its infantry supports and capturing some of the pack animals and some of the ovens in which food was being prepared. The Russians followed the Japanese to about 3 miles southeast of Kenchuanagtzu and then withdrew.

OPERATIONS IN THE VICINITY OF LIAOYANG.

(Plate X.)

At the time of the Japanese advance on Liaoyang the Russian forces in that vicinity were organized and stationed as follows:

	Battalions.	Guns.	Sotnias.
I. The southern group, Lieutenant-General Zarubaiev, at Anshantien:			
a. 1st Siberian Corps.....	21	88	20
b. 2nd Siberian Corps (5th Division).....	12	32	11
c. 4th Siberian Corps.....	24	32	11
d. Mounted Detachment.....		6	18
Total.....	57	158	60
II. The eastern group, General Bilderling, containing:			
a. In the position near Lantzushan the 3rd Siberian Corps.....	24	68	17
b. In the mountain range east of Anping the 10th Corps.....	20	88	18
c. On the right bank of the Taitzu under Major-General Yanzhul.....	8	44	a 6
d. Reserve at and near Liaoyang.....	19	64	a 6
Total.....	71	264	a 47
III. Army reserve:			
a. In Liaoyang.....	30	48	22
In intrenched camp.....	6	64	3½
b. In and near Mukden—			
5th Siberian Corps.....	27	48	
Mukden garrison.....	3		
Total.....	66	160	25½
IV. Flank detachments:			
a. Pensihu.....	5	4	6½
b. Weinungying.....		4	12
c. Near Chinghochon.....	2	2	12
d. At Tawan (on Liao River).....	3	4	8
Total.....	10	14	38½
V. Lines of communications.....	19½		
Army total.....	223½	596	171

a Squadrons.

Of these the Russians report 128 battalions taking part in the battle, 49 battalions in reserve, 10 battalions guarding the flanks, 12 battalions in rear; joined during the battle, 16 battalions and 24 guns, belonging to the First European and First and Fifth Siberian Corps, making the total effective strength available for battle about 165,000.

RUSSIAN UNITS AND COMMANDERS.

Corps.	Commander.	Division.	Commander.
1st Siberian.....	Stackelberg.....	1st East Siberian Rifle.....	Gerngross.
		9th East Siberian Rifle.....	Kondratovich.
2d Siberian.....	Zasulich.....	5th East Siberian Rifle.....	Alexiev.
		2d Brigade, 17th Infantry Division.	
3d Siberian.....	Ivanov.....	3d East Siberian Rifle.....	Kashtalinski.
		6th East Siberian Rifle.....	Danilov.
4th Siberian.....	Zarubaiev.....	2d Infantry.....	Revestan.
		3d Infantry.....	Kotsurich.
5th Siberian.....	Dembovski.....	54th Infantry.....	Orlov.
		71st Infantry.....	Eck.
10th Army.....	Sluchevski.....	9th Infantry.....	Herschelmann.
		31st Infantry.....	Mau.
17th Army.....	Bilderling.....	3d Infantry.....	Volkov.
		35th Infantry.....	Dobrzhinski.

JAPANESE UNITS AND COMMANDERS.

Army.	Commander.	Division.	Commander.
1st.....	Kuroki.....	Guards.....	Hasegawa.
		2d.....	Nishi.
		12th.....	Inouye.
		Kobi Brigade.....	Umezawa.
		3d.....	Oshima.
		4th.....	Ogawa.
2d.....	Oku.....	6th.....	Okubo.
		1st Cavalry Brigade.....	Akiyama.
		1st Artillery Brigade.....	Uchiyama.
		Two Kobi Brigades.....	
4th*.....	Nodzu.....	5th.....	Ueda.
		10th.....	Kawamura.
		One Kobi Brigade.....	

During the latter portion of the battle the artillery brigade was attached to the Fourth Army.

The total effectives taking part in the battle was about 140,000.

In moving on Anping the Japanese First Army operated in three columns against the Russian eastern group. The Guards moved by the main Fenghuangcheng-Erhtaoho road against the Lantzushan position; the Twelfth Division moved on the Saimachi-Hsihoyen-Anping road; the Second Division, in the center, operated via Tienshuitien and Santaoing against the Russian position through Tsuekou and Height 2070.

As the Japanese concentration against Tsuekou became apparent the Second Brigade of the Russian Thirty-first Infantry Division crossed from the right bank of the Taitzu River and the forces defending Anping were rearranged as follows: The "right fighting section," under General Herschelmann, had in the first line between Height 2070 and Miao-

ling 16 battalions, 54 guns, 8 sotnias, and 2 mounted detachments; in rear of the right of this line was a reserve of about 10 battalions, with artillery, under Major-General Rabinkin; in rear of the left was a reserve of about 5 battalions, with artillery, under Major-General Prince Orbeliani; south of Anping were two batteries, with a battalion escort, arranged to fire on the Tsuekou position should it be carried by the Japanese.

Colonel Klembovski, with the One hundred and twenty-second (Tambov) Regiment, the Seventh Battery of the Thirty-first Artillery Brigade, and 2 sotnias, held the position on Height 1911 (Hungshaling).

The general reserve, under Major-General Vasiliev, was in two groups; one, of 4 battalions, at Anping, and the other, of 8 battalions and 50 guns, at Shunshuyantzu.

The Guards advanced on August 23, being opposed only by small patrols, and on the 24th occupied a line passing through Erhtaoho, the Second Brigade (Watanabe) on the right, the First Brigade (Asada) on the left; the Second and Twelfth Divisions moved forward on the afternoon of the 25th. At about 5.45 a. m. on the 25th the Guards artillery, from the height north of Takou, opened fire with one battery on the Russian line near Kofuintzu, and the infantry drove back the Russian outposts to the line Tahsintun-Tahsikou.

To meet the concentration of the Japanese infantry near Takou the Russian line was prolonged from the height west of Kofuintzu through that north of Hsiaohsikou to near Pao-shukou. This echelon, containing $7\frac{1}{2}$ battalions, $13\frac{1}{2}$ sotnias, and 20 guns, was placed under the command of Major-General Kashtalinski. To further strengthen the threatened right flank of the Lantzushan position two regiments of the Thirty-fifth Division, Seventeenth Corps, and 3 batteries were concentrated at Hsiaoling during the night of the 25th; the One hundred and fortieth (Zaraisk) Regiment, same corps, 1 battery and 6 squadrons left Tsaofangtun at midnight, moving via Weichiakou on Kofuintzu. General Bilterling also shifted 2 regiments from the right to the left bank of the Taitzu, stationing the main body at the bridge at Hsiaotuntzu, and sending 3 battalions to Kinchiatunhsikou.

During the night of August 25 the Japanese Twelfth Division, Twenty-third Brigade (Kigoshi) on the right, the

Twelfth Brigade (Sasaki) on the left, moved forward and attacked Hungshaling and Chipanling. The attack of the left column, made in conjunction with the Second Division, drove back the Russians occupying the line from near Tsuekou to Miaoling to the line Tsuekou-Sanchiatzu, but the Russian force at Hungshaling successfully resisted the attack.

During this attack the Second Division also moved forward, the Fifteenth Brigade (Okasaki) on the right, the Third Brigade (Matsunaga) on the left, and attacked the Russian line, in advance of Tsuekou, running from Chipanling to Height 2070, and carried the greater part of the same by dawn. The Russian reserve, under Major-General Vasiliev, already en route to make a strong démonstration beyond Tsuekou, reenforced this part of the line, and severe fighting continued until about noon of August 26. The Russians occupied the line from Height 2070 to Yuchiakou and about 1.30 p. m. their artillery near Anping opened fire, thus assisting the troops that were being driven back from the position between Tsuekou and Sanchiatzu.

At 1.30 a. m. on August 26 Lieutenant-General Ivanov sent from Hsiaoling the 2 regiments of the Thirty-fifth Division, 2 batteries and 1 squadron to take up a position on the height north of Kofuintzu.

At 5.35 a. m. the Guards artillery, increased to 60 guns from the artillery of the Second Division, on a line from Ertahou to the height north of Takou, opened fire on the Russian positions, especially on the heights west of Kofuintzu. The infantry of Asada's brigade which had driven in the Russian outposts, by noon had advanced to a line along the stream from Hsiaohsikou to the foot of the height south of Paoshukou, practically outflanking the Russian right. The Zarsk Regiment, en route from Sanshantzu to Changchiaopu, on reaching a point about midway between these towns, learned of the situation. Its commander moved to Paoshukou and attacked down the valley. The Japanese line was driven out of the valley and by 2 p. m. the Zarsk Regiment had occupied the bluffs just north of Tahsikou, where it remained controlling with its fire the valley about Tahsikou. During the forenoon the Twenty-ninth Kobi Regiment, then in the reserve of the Japanese First Army, was ordered to march to the assistance of the Guards Division.

At 6 a. m., August 26, the attack of the right column of the Japanese Twelfth Division had reached Hungshaling (called the Peikou position by the Russians), one mountain battery firing for a short time from the height about 1 mile northeast of Heiyu. Unsuccessful at first, the attack was repeated in the afternoon with increased severity, and by 6 p. m. the Tambov Regiment and two battalions sent to its assistance were compelled to withdraw with the loss of the 8 guns of the Thirty-first Artillery Brigade.

General Kuropatkin ordered that Peikou be retaken at any cost, but before the execution of this order was begun he ordered withdrawal from the Lantzushan-Anping positions, the second order reaching General Bilderling about midnight.

The Russians withdrew their main forces, leaving rear guards to delay the Japanese advance. By evening of the 27th the Japanese occupied a line from Hungshaling along the heights close to the right bank of the Tang River to Kofuintzu and then through the heights north of Tahsikou. The Russians remaining in the triangle formed by the Taitzu and Tang rivers retired across the latter over a military bridge, near Shuangmiaotzu, which they then destroyed, floating the pontoons down to the Taitzu River.

General Kuroki reported the capture of 8 guns, a quantity of ammunition, and various articles; also that his losses on the 26th and 27th were about 2,000.

General Kuropatkin reported that the battle was a serious one, and General Sakharov reported that the Russians had lost over 1,500; the greater portion of their losses occurred in the Tenth Corps.

On August 27 the Japanese Fourth and Second Armies reached a line extending from Shangshihchiaotzu to west of Sumatai, skirmishing with some Russian detachments during the advance, and prepared to attack the Anshantien position, held by the First, Second, and Fourth Siberian Corps. As a result of the progress of the fighting near Anping the Russians at Anshantien did not offer serious resistance. In their withdrawal the Russians were followed closely by the Japanese columns, which by 10 a. m. on the 28th had advanced to a line through Tiaochuntai-Tashitou-Taokuantun and were able to bring an artillery fire upon some Russian columns crossing the Sha River.

During the withdrawal 1 battery, 8 guns, of the First Siberian Corps, mired so badly that it was found impossible to remove it, even when using all available horses assisted by soldiers with ropes, and was abandoned to the Japanese.

On August 28 in the Japanese First Army the action of the Twelfth Division was confined to artillery fire with the opposing Russians on the right bank of the Taitzu and left bank of the Tang. The Second Division attacked and displaced the Russian rear guard from the heights north and west of Sanchiasai, Matsunaga's brigade continuing to Height 1701. The Guards advanced and, after some severe fighting, especially north of Wantsikou, occupied the line of heights through Ssufangtai-Sanshantzu.

On August 29 the Twelfth Division began preparations to cross to the right bank of the Taitzu; the Second Division occupied Shihtsuitzu and Tashilmenling; the Guards advanced to the heights south of Hsuchiakou and reconnoitered toward Yayuchi. In the Japanese Fourth Army the Tenth Division effected a junction with the left of the Guards Division near Weichiakou, drove the Russians from that locality, and advanced toward Mengchiafang; the Fifth Division occupied a line from Laichiapu to Heiniuchuang. The Japanese Second Army occupied the line of the Sha River with its right advanced to Heiniuchuang.

To meet the advance of the Japanese armies General Kuropatkin, on August 29, issued an order under which the various organizations under his command were to occupy the prepared positions and oppose a determined resistance to the further advance of the Japanese. The details of the occupation of positions were under corps commanders.

As a result of said order in the First Siberian Corps (General Stackelberg), 9 battalions and 24 guns, under Major General Gerngross, held the line from Kuchiatzu to the Hsiaoyangtzu-Shoushanpu road; 6 battalions and 24 guns, under Major-General Kondratovich, extended the line from that road to the Hsiaoyangtzu-Hsinlitun road; the Thirty-third Regiment was on the height of Fangchiatun; 9 battalions, under Major-General Zikov, were held as reserve at the village of Shoushanpu; 2 batteries were near Chuangchiatun, facing west; 2 were west of the Mandarin road, north of the spur cut by that road from the ridge north of

Hsiaoyangtzu; 2 were in rear of the first dip and 2 in rear of the second dip east of the Mandarin road; 2 were in the saddle of the Fangchiatun-Nanpalichuang road; Colonel Gurko, with 8 squadrons and sotnias, was at Nanpalichuang.

In the Third Siberian Corps (Lieutenant-General Ivanov), 6 battalions and 16 guns, under Major-General Danilov, held the heights west and south of Tsaofangtun as far east as the Tsaofangtun-Weichiakou road, the artillery being on the north slope in rear of depressions, and 1 battalion holding an isolated peak in front of the main line; 9 battalions, under Major-General Stolitz, extended this line to across the Suichangyu-Mengchiasang road. Thirty-two guns were placed on the northern slope of the line of low hills north of Tsaofangtun, a position that gave a good field of fire on the low ground between the First and Third Siberian Corps; 32 guns were placed on the northwestern slope of the spur that terminates at Suichangyu. The general reserve, 19 battalions and the 2 mountain batteries, under Major-General Kashalinski, was at Tsaofangtun. The 6 sotnias, also, were at Tsaofangtun, ready to reconnoiter the gap between the First and Third Siberian Corps.

In the Tenth Corps (Lieutenant-General Sluchevski) 8 battalions under Major-General Herschellmann, held the line from the left of the Third Siberian Corps to the Kaolingtzu-Wangpaotai road; Major-General Vasiliev, with 8 battalions, held the line from that road to Hsiaopu.

The 12 mortars were in the saddle over which the Kaolingtzu-Yayuchi road passes; 32 guns were at Kaolingtzu; 32 were at Hsiaopu and on the line between that village and Yayuchi; 8 battalions and 24 guns were in reserve at Kaolingtzu; 8 battalions were in reserve at Suichangyu.

In the army reserve Lieutenant-General Zasulich (Second Siberian Corps), with 16 battalions, 32 guns, 2 sotnias, and 1 sapper battalion, was between Hsituchiaotzu and Tungpalichuang, 4 of his battalions occupying a fortified position near Pachiakangtzu; Lieutenant-General Zarubaiev (Fourth Siberian Corps), with 22 battalions, 32 guns, 6 sotnias, and 1 sapper battalion, was near Talingtzu; Major-General Samsonov, with 19 sotnias and 6 guns, was at Changchialintzu, within the line of forts; Major-General Maslov, commander

of the intrenched camp of Liaoyang, had 9 battalions, 32 guns, and 2 sotnias.

On the right flank Major-General Mishchenko, with 16 guns and 21 sotnias, was moving south on Wuluntai, with instructions to connect with the detachment of 1 battalion, 12 guns, and 14 sotnias under Major-General Vladimir Grekov at Hsiaopeiho.

The left flank was guarded by $18\frac{1}{2}$ battalions, 74 guns, $13\frac{1}{2}$ squadrons and sotnias under General Bilderling. Of these forces, $2\frac{1}{2}$ battalions and 8 guns were in position at Hsikuantun; 4 battalions and 24 guns near Hsiaowagotzu; 8 battalions and 36 guns were in position from the heights at Sanwantzu to that at Tsofankou; 12 squadrons and sotnias were at Hsikuantun and Chuankufen; the Fifty-second Dragoon Regiment was reconnoitering the right bank of the Taitzu River above Kuantun.

Major-General Orlov, with 8 battalions, 16 guns, and 1 sotnia, was near Shahopu.

In the Japanese army at this time the orders were for the left of the First Army and the entire Fourth Army to attack the Russian line from the Wangpaotai-Kaolingtzu road to Heiniuchuang, and for the Second Army to attack the Shoushanpu position. To comply with this order General Oku issued the following order:

1. The enemy is still holding his position on the heights of Shoushanpu and Hsinlitun. Our cavalry brigade has advanced to the vicinity of Wangerhtun.

2. The army will advance on the 30th against the line Shoushanpu-Fangchiatun, with a view to attacking the enemy.

3. The Third Division will leave the line of the Sha River at 5 a. m., August 30, will move east of the railway on the front Tataitzu-Heiniuchuang, and advance against the southern and southeastern heights of Shoushanpu. One regiment of the artillery brigade is attached to the Third Division.

4. The Sixth Division will leave the line of the Sha River at 5 a. m. in conjunction with the Third Division, marching between the railway and the road through Tayaotun, Tachuntzu, Likaipu, and Liuchiasanchiatzu.

5. The Fourth Division will leave the line of the Sha River at 6 a. m. and, marching by the western road, will assemble at Hsinglungtai.

6. The artillery brigade (less one regiment) is under the commander of the Sixth Division and will march closely behind the same. In case of being compelled by bad roads, it may march on the Mandarin road.

7. The foot artillery (34 guns and mortars) will march at 5 a. m. via the Mandarin road.

8. The infantry reserves (two Kobi brigades) will march at 5 a. m., following the railway, and assemble at Shaho village.

9. The commanding general will start along the railway at 5 a. m. and will be found at Shaho village.

In compliance with the above order the commander of the Third Division issued the following order:

1. The enemy is still holding his positions south of Shoushanpu and Hsinlitum. The advance guard of our cavalry brigade is expected to reach the vicinity of Wangerhtun to-day. The army is to advance to-day to the line Shoushanpu-Fangchiatum, with a view to attacking the enemy. The Sixth Division is to leave the line of the Sha River at 5 a. m. and is expected to reach the line Liuchiasanchiatzu-Kuchiatzu, advancing on the roads west of the Mandarin road and to include the road through the villages of Tayao-tun, Tachuntzu, and Likaipu.

2. The Third Division will advance against the southern and eastern hills of Shoushanpu.

3. The Thirty-fourth Infantry Regiment, a section of cavalry, the Third Artillery Regiment (less one battalion), and one section of the Third Engineer Battalion will form the advance guard of the Seventeenth Brigade and will march on the southern hill of Shoushanpu via the Mandarin road.

4. The Sixth Infantry Regiment, one battalion of the Third Artillery Regiment, and one section of the Third Engineer Battalion will form the advance guard of the Sixth Brigade, will leave the line of the Sha River at 5.20 a. m. and march on the hill north of Hsiaoyangtzu via Yangchiaochuang and Heiniuchuang.

5. The troops forming the main body of the left column will start at 6 a. m., following the advance guard closely in the following order:

(a) Squadron of cavalry (less two sections); (b) division headquarters; (c) Eighteenth Infantry Regiment; (d) headquarters and one company of the Engineer Battalion; (e) Thirteenth Artillery Regiment; (f) Thirty-third Infantry Regiment; (g) Ambulance Corps.

6. The division commander will be at the head of the main body of the left column.

About 5 a. m. on August 30 a small detachment from the Guards attacked the Russian line near Mengchiafang. The attack was followed by an exchange of artillery fire that continued for about four hours. The Guards again opened a heavy artillery fire about 10 a. m. on the Mengchiafang-Yayuchi positions and moved the infantry forward to about 1,000 yards from the Russian line.

About 5.30 a. m. a battalion from the Tenth Division and Kobi brigade attacked the hill held by the Russians as an advance post in front of the Third Siberian Corps. A few minutes later a Japanese battery opened from near Kuchiatzu, and the attack with increasing force was twice repeated

and the hill carried about 6 a. m. From the reserve of the Third Siberian Corps two battalions were sent to reenforce its right, which was now subjected to a very severe infantry fire from the line through the hill just carried by the Japanese. The Japanese artillery from south of Mengchiafang, near Weichiakou and Shihchiyotzu, also opened fire on this portion of the Russian line; and the infantry began advancing down the valley from Shihchiyotzu toward Wichiakou.

At 7 a. m. General Kuropatkin ordered Lieutenant-General Zasulich to send 3 battalions to the reserve of the Third Siberian Corps. Six battalions of the Tenth Corps also were sent to the reserve of the Third Siberian Corps, but a little later 4 of these battalions were returned to the Tenth Corps.

The attack down the valley toward Wichiakou was opposed not only by the right of the Third Siberian Corps, but also by the force under Major-General Putilov near Pachiakangtzu, now consisting of $7\frac{1}{2}$ battalions, 55 guns, and 6 sot-nias. This attack was followed by several others against different portions of the front occupied by the Third Siberian Corps. About 1 p. m. these attacks ceased for a time, the artillery fire continuing. The fighting had been severe and the losses on both sides heavy. The only material advantage on either side was the capture by the Japanese of the hill held as an advance post in front of the right of the Third Siberian Corps.

About 3.30 p. m. the Japanese again attacked, advancing against the western Yayuchi heights on both sides of the Tsaofangtun-Weichiakou road and on Pachiakangtzu. Some of the trenches occupied by the Eleventh Rifle Regiment on the left of the Third Siberian Corps were captured about 4.30 p. m. The Eleventh Regiment, assisted by a regiment from the reserve and the fire of the Russian artillery, assumed the offensive and drove the attacking party back to Hsuechiakou. The attack of the right brigade of the Guards on the western height of Yayuchi was partly successful, but was halted by the arrival of 4 battalions sent from the reserve of the Tenth Corps to strengthen its right. About 7 p. m. the Japanese Third Brigade made an attack on the height east of the Kaolingtzu-Wangpaotai road, which lasted until 10 p. m., causing 3 battalions to be sent from the reserve of the Tenth Corps to that portion of its front.

During the afternoon attack on the Tsaofangtun heights and Pachiakangtzu 2 battalions of Russians from the latter position assumed the offensive, advancing as far as Wichiakou.

On August 30, also, the Japanese Fifth Division, moving in conjunction with their Second Army, attacked the Shoushanpu position. Contact with the Russians was first gained by troops of the Fifth Division in the vicinity of Tawan at dawn. About 6 a. m. the Japanese artillery opened fire from a line running generally from Heiniuchuang through Height 224 to Taputzu. The infantry of the Third Division, on reaching the line through Heiniuchuang and Tataitzu, was extended into the hills east of Heiniuchuang, joining the Fifth Division and occupying Hsiaoyangtzu about 10.45 a. m.

By 11 a. m. the Japanese Sixth Division had reached a line through Tachaochiatai and opened fire against the Russian trenches at Mayetun and Kuchiatzu. At about the same time General Kuropatkin received a report from Major-General Mishchenko saying he had found the villages of Wuluntai, Binmatun, and Baichialaoguawo occupied by small detachments of Japanese. General Kuropatkin ordered that 2 battalions from the Fourth Siberian Corps and 8 sotnias from the Ural regiments be sent to General Mishchenko. Three battalions from the Second Siberian Corps were sent to the First Siberian Corps, and the Twelfth Siberian (Barnaul) Regiment and 12 guns from the Fourth Siberian Corps were ordered to march to the line of the railway north of Kuchiatzu. A little later the Seventh (Krasnozhar) Regiment and 12 guns from the Fourth Siberian Corps were placed at the disposal of General Stackelberg and ordered to Hsipalichuang.

About 2 p. m. the battery with the Japanese cavalry reached a position near Wangerhtun that permitted a fire upon the rear of the Russian position at Shoushanpu.

In the meantime one Kobi regiment was sent to reenforce the right of the Third Division, which, with the left of the Fifth Division, was operating against the height northeast of Hsiaoyangtzu, causing the 8 battalions and 2 batteries of the Second Siberian Corps to be sent from Tungpalichuang

to Hsipalichuang, while 2 batteries were placed at the disposal of General Stackelberg and sent to Fangchiatun.

The Twelfth Siberian (Barnaul) Regiment reached Yuchiachantzu at 5.30 p. m. The accompanying 12 guns took up a position along the railway and opened fire on Chuchiaputzu, Baichialaoguawo, and Hsiaochingtsuitzu. Assisted by the Seventh (Krasnozhar) Regiment, the Barnaul Regiment occupied Chuchiaputzu and stopped the advance parties of the left of the Japanese Sixth Division and of a column of 4 battalions from the Fourth Division which had prolonged the Japanese left. The rifle fire continued in the neighborhood of Chuchiaputzu until midnight, when the Russians in that vicinity appear to have retired to the railroad.

At nightfall Major-General Mishchenko retired to Tanchuangtzu.

At 4.25 p. m. General Oku was informed that the Russians had taken the offensive from the Tsaofangtung position, and was directed to drive the Russians from the Shoushanpu position as quickly as possible. Accordingly, night attacks on that position were contemplated. The attack to the west of Shoushanpu was deferred because of the Russian offensive on that part of the field. The attack of the Third Division began to develop toward morning of August 31. During the night the Japanese Tenth Division made a demonstration against the right flank of the Tsaofangtung position and small parties occupied Wichiakou, Minchialantzu, and Tassu.

During the night of the 30th and on the 31st of August the Japanese Twelfth Division and the Fifteenth Brigade, Second Division, forded the Taitzu River in the neighborhood of Lientaowan and, with but little opposition, by 6 p. m. had occupied the heights extending from west of Kuantun to near Tsakou, the Twelfth Division on the right. At Goyo was constructed a pontoon bridge, by which artillery crossed during the night of the 31st.

Information of the crossing reached the commander of the Fifty-second Dragoon Regiment at 6.20 a. m. and General Kuropatkin at 11 a. m., the delay being said to have resulted from a break in the wires leading from the Seventeenth Corps to headquarters. In compliance with an order sent from General Kuropatkin's headquarters at 11.30 a. m.,

Lieutenant-General Dobrzhinski, with $8\frac{1}{2}$ battalions of the Seventeenth Corps, occupied a position on the eastern slopes of Height 917, through Hsikuantun and Manjuyama, placing 16 guns near Hsikuantun and 32 east of Sahutun.

To guard the left of this position Major-General Orbeliani, with $2\frac{1}{2}$ battalions, 6 guns, and 16 sotnias, was sent to Yangchiaputzu. The Fifty-second Dragoon Regiment had retired before the Twelfth Division to Choheiyentai.

In the meantime the Guards Kobi Brigade crossed the Taitzu River, surprised the sotnia at Weiningying, and advanced to Pensihu. General Liubavin, who had 6 sotnias and 4 guns at Pensihu, 1 sotnia at Weiningying, and 2 sotnias at Sanchiatzu, withdrew to Hsiaoshihchiaotzu, where he was joined the next day by the Two hundred and thirteenth Orovaik Regiment and 1 battery.

At 3.20 a. m. August 31 the Japanese attempted to break through along the Mengchiafang-Suichangyu road and at 5.30 a. m. made an attack against the right of the Tsaofangtun position that continued until about 8 a. m. From that time on the Third Siberian Corps was not subjected to any severe attack on the 31st, although several times subjected to a severe artillery fire and several lesser attacks in the afternoon. During the afternoon the Russians from the Pachiakangtzu position drove the Japanese out of Minchialantzu and Tassu.

In front of the Russian Tenth Corps all was quiet except a reconnaissance by a Russian regiment, which advanced as far as Chututai and was then ordered to return.

About 3 a. m. the Japanese began an attack on the positions of the First Siberian Corps that continued throughout the day with practically no interruptions. The right of the Third Division, in conjunction with the Fifth Division, attacked the height northeast of Hsiaoyangtzu. The Sixth Division renewed the attack on Mayetun, being assisted by the fire of a large number of guns. The Fourth Division was advancing through Chuchiaputzu, Hsiangohotzu, and Chougohotzu with an advance company as far as Yuchia-chantzu. The First Cavalry Brigade was in the vicinity of Wangerhtun with a detachment at Shuitsuiyan.

In the early morning Major-General Mishchenko moved from Tanchuangtzu toward Wuluntai, his 2 battalions of the Tenth Siberian Regiment driving the Japanese out of

Shuitsuiyan. The 2 Russian batteries at Chuangchiatun were directed to fire against the Japanese to the west, and 7 battalions of the First Siberian Corps reserve were moved to Shoushanpu, leaving but 2 battalions in reserve at Fang-chiatun.

By noon the attack against the Shoushanpu position was general and very severe. Shortly after noon the Japanese captured some of the advance trenches near the Hsinlitun-Hsiaoyangtzu road and reached the crest of the elevation. Here they were subjected to artillery fire from east of Fang-chiatun in addition to the fire of the infantry they were attacking, and were driven back about 1.45 p. m. to the lower trenches.

About noon the Twelfth Siberian (Barnaul) Regiment and 1 battalion from the reserve drove the Japanese company out of Yuchiachantzu.

The First Siberian Corps was hard pressed throughout the day, being under a continuous fire of infantry and artillery, the fire of the latter being particularly severe from about 5 p. m. until after 7 p. m. and coming from all the Japanese artillery within range.

On receipt at 11 a. m. of the report of the Japanese crossing the Taitzu River, General Kuropatkin decided to withdraw to the main Liaoyang position and to concentrate the troops thus rendered available against the Japanese on the right bank. This decision was communicated to corps commanders about noon, with instructions to defer the withdrawal until after nightfall. The withdrawal was rendered less difficult than it would otherwise have been by the fact that on both the 30th and 31st the trains were being sent to the right bank of the Taitzu River, while the railroad had been actively employed in the removal of stores and the evacuation of the wounded.

In the withdrawal the Eighty-fifth and Two hundred and Eighty-second Regiments, with 8 guns, under Major-General Eck, were to lead, going to Ertaokou (near Hsikuantun).

The Tenth Corps was to go to Sinchung, sending 2 battalions and 16 guns to occupy the position on the right bank of the Taitzu River near Muchang, and 8 battalions and 24 guns to the Liaoyang garrison.

The Third Siberian Corps, timing its withdrawal with that of the First Siberian Corps, so as to protect the left flank of the latter, was to concentrate along the north wall of Liaoyang, detaching 6 battalions and 16 guns to the Liaoyang garrison.

The Second and Fourth Siberian Corps were to join the Liaoyang garrison, to be commanded by Lieutenant-General Zarubaiev, thus raising the garrison to 64 battalions, 102 field guns, 22 heavy guns, 24 mortars, 10 sotnias, and 2½ battalions of sappers.

The First Siberian Corps and the force under Major-General Mishchenko were to withdraw entire to the right bank of the Taitzu River.

The Seventh (Krasnozhar) Siberian Regiment, with 2 additional battalions, was to hold its position near Yuchiachantzu, covering the withdrawal of the First Siberian Corps and protecting the railroad station.

At 6 p. m. Major-General Samsonov was ordered to at once proceed to and occupy the Yentai mines, to reconnoiter southeast of the same and protect the left flank of the Seventeenth Corps. A little later Major-General Orlov, with his 12 battalions, 16 guns, and 3 sotnias, was ordered to proceed at daybreak on September 1 from Yentai Station to Hsiaotailienkou, there to reconnoiter and attack the right flank of the Japanese, and to fall back toward the Yentai mines should he find the Japanese in superior strength.

The Russian withdrawal was carried out as ordered. The First Siberian Corps began its withdrawal at 9 p. m. and concluded about 3 a. m. on the morning of September 1, at which time the First Siberian Regiment withdrew under rifle fire from near Mayetun. The Third Siberian and Tenth Corps, leaving as rear guards the detachments that were to be sent to the Liaoyang garrison, withdrew without being molested. The Shoushanpu position was occupied by the Japanese by dawn of September 1, and the Tsaofangtung position was occupied during the forenoon of the same day. The Japanese Second and Fourth Armies were then fronting the main line of defense south and west of Liaoyang.

This line consisted of strongly constructed field works, from 800 to 1,800 yards apart, connected by a network of shelter trenches, gun emplacements being in general back

of and opposite the center of the interval between field works. The line began at a point about three-fourths of a mile southeast of Ufa, ran west to the railway, turned sharply north and ran through Hsinerhehung to Fort No. 8 on the right bank of the Taitzu River. A second defensive line ran from the northwest corner of the city wall to the river.

Including the railway bridge and the one constructed at Ufa, 8 bridges crossed the Taitzu River within the main defensive line.

On the morning of September 1 the Russian forces were distributed as follows:

I. Seventeenth Corps: (a) Major-General Yanzhul, 8 battalions, 40 guns, and 2 squadrons, was holding the line from Sanwantzu to Tsofankou; (b) Lieutenant-General Dobrzinski, 16½ battalions, 96 guns, and 4½ squadrons and sotnias, was holding a line from the spur southwest of Hsikuantun through that village to include Manjuyama; (c) Major-General Eck, with his unattached brigade of 7 battalions, 8 guns, and 2 sotnias stationed at Tutaokou and Chouchingtzu, acted as reserve to the corps; (d) Major-General Orbeliani, 2 battalions, 6 guns, and 12 squadrons, was at Choheiyentai with instructions to reconnoiter to the east and toward the Yentai mines, and to protect the left flank of the corps.

II. Tenth Corps: (a) Main body, 22 battalions, 58 field and 7 mountain guns, 12 mortars, and 4 sotnias, was at Fenshan, Shangwagotzu, and Shichotzu; (b) 8 battalions and 24 guns were in the Liaoyang garrison; (c) 2 battalions and 16 guns held a portion of the Muchang position.

III. First Siberian Corps: (a) The First Division was at Liutsuichuang; (b) the Ninth Division was at Yingtsuishi; (c) Colonel Gurko, with his 9 squadrons and sotnias, was at Kaolichiang. The corps was much reduced in numbers. The Thirty-third Regiment was merged with the Thirty-fifth Regiment, bringing the strength of the latter up to 5 companies of 10 officers and 1,020 men. Eight fresh battalions joined the corps about this time.

IV. Third Siberian Corps: (a) 18 battalions, 48 guns, and 4 sotnias were at Chaochialing; (b) 6 battalions and 16 guns were with the Liaoyang garrison.

V. General Mishchenko, with 21 sotnias and 12 guns, was at Siaichiatun.

VI. Major-General Orlov, with 12 battalions, 20 guns, and 2 sotnias, was on the branch railway near Hsiaotalienkou.

VII. Major-General Samsonov, with 6 guns and 19 sotnias, was at the Yentai mines.

VIII. Major-General Liubavin had 4 battalions, 12 guns, and 12 sotnias at Hsiaoshihchiaotzu and Shangpingtaitzu.

IX. Major-General Vladimir Grekov, with $1\frac{1}{2}$ battalions, 12 guns, and 4 sotnias, was on the right bank of the Taitzu between Liaoyang and Hsiaopeiho, his right connecting with Major-General Kossagovski's detachment at Tawan on the Liao River.

X. Lieutenant-General Zarubaiev, with 58 battalions, 118 guns, 24 mortars, 10 sotnias, and $2\frac{1}{2}$ battalions of sappers, was in the Liaoyang defenses on the left bank of the Taitzu River.

Major-General Kondratovich, with 6 battalions, 8 guns, and 2 sotnias of the Liaoyang garrison, was on the right bank of the Taitzu River near Fort No. 8, with orders to assist Major-General Grekov in guarding the Taitzu below Liaoyang.

While the Liaoyang garrison and troops assigned to protect the flanks of the same were to hold back any direct advance of the Japanese Second and Fourth Armies the remainder of the Russian forces under immediate command of General Kuropatkin were to carry out the following plan:

The Seventeenth Corps was to hold the Hsikuantun position as a pivot; the Tenth Corps, First Siberian Corps, and the troops under Major-General Mishchenko were to advance on the front Sahutun-Hsiaotalienkou; Major-General Orlov was to move on Chuankufen, coordinating his movements with those of the First Siberian Corps; Major-General Samsonov was to move on the extreme left flank, reconnoitering toward Pensihu; 2 regiments of the First Corps were to move from Mukden to Shahopu to take the position vacated by Major-General Orlov. The Third Siberian Corps was to act as reserve of this force.

The organizations taking part in this attack were to assemble on the 1st, the concentration was to take place on the 2d, and the attack was to be made on the 3d of September. The troops taking part were to aggregate 95 battalions, 60 sotnias and squadrons, and 342 guns, making a force of about 67,000 bayonets and 5,000 sabers.

On September 1 the Japanese Fifteenth Brigade, assisted by the Twelfth Division on its right, began advancing against Manjuyama. At 6.30 a. m. the Japanese artillery opened fire from the ridge east of Chuankufen and the Russian advance posts retired from the ridge west of Chuankufen, which was occupied by the Japanese about 8 a. m. The exchange of artillery fire continued with but little interruption throughout the day; the Japanese firing from near Kuantun and Tsakou, the Russians firing from near Hsikuantun, Yangchiatun, and Choheiyentai.

In the Russian position the Tenth (Novoingermanland) Regiment occupied Hsikuantun and the slopes southwest and northeast of the same; the One hundred and thirty-seventh (Niezhin) Regiment occupied Manjuyama; the One hundred and fortieth (Zaraisk) Regiment was on the left of the Niezhin Regiment, the One hundred and thirty-ninth (Morshansk) and One hundred and thirty-eighth (Bolkhov) Regiments were in reserve.

About 7 p. m. the Japanese artillery increased its fire, and about 8 p. m. the Fifteenth Brigade, the Thirtieth Regiment on the right and the Sixteenth on the left, assaulted Manjuyama in front and on both flanks. The companies of the Novoingermanland Regiment that were in Hsikuantun and on the slope to the northeast gave way and retreated to Sahutun, thus exposing the right flank of the Niezhin Regiment. The left of the latter regiment also gave way, but was brought back with the aid of two companies of the Bolkhov Regiment. The artillery with the Novoingermanland Regiment retired to Tutaokou.

After a struggle of about one hour, the assault was repulsed and the Japanese artillery again began firing on Manjuyama. This was followed by a second assault, which again reached the crest but was driven back a short distance with the aid of 2 battalions of the Morshansk Regiment on the right of the Niezhin Regiment. The assault persisted and the Japanese finally occupied the crest about midnight, the opposing Russians falling back to the line from Height 917 through Sahutun to Choheiyentai.

The Japanese Third Brigade, Second Division, began to arrive toward night of September 1, and 3 companies of

the Twenty-ninth Regiment assisted in the capture of Manjuyama.

The Japanese Twelfth Division appears to have been placed on the defensive during September 1 by the Zaraisk Regiment and the threatened advance of the Russian forces to its north. Major-General Orlov by 4 p. m. had posted 4 battalions and 12 guns on the crest of the heights between the Yentai mines and Fangshen. The remaining 8 battalions and 8 guns were near the mines, as was also the command of Major-General Samsonov. Major-General Orbeliani was south of Fangshen, reconnoitering to the east, and the Fifty-second Dragoon Regiment was on the heights north of Tapu.

A small party of Japanese was in Tapu, and the heights south of that village were held by a larger force, the Twelfth Brigade, Twelfth Division.

In the Pensihu region there was a desultory engagement between the cavalry of Major-General Liubavin and the Kobi Brigade of Major-General Umezawa. After the engagement Major-General Liubavin fell back to Shangpingtaitzu, where he was again joined by his 3 sotnias from Weiningying and Sanchiatzu, and by 4 battalions of infantry.

The Japanese Second Army advanced infantry and artillery to the line Yuchiachantzu-Wanpaoshan, and a battery of mortars from near Shoushanpu fired at the railroad station and the town during the afternoon.

Early on September 2 Major-General Orlov moved south along the Fangshen heights, and when northwest of Tapu came into contact with the right brigade (Shimamura) of the Japanese Twelfth Division. In a short time the Russians fell into confusion, lost heavily, and withdrew, a portion retiring west and the remainder taking up position farther north on the Fangshen heights. The Japanese continued their attack upon this latter portion, driving it also to the west. By noon the Japanese Twelfth Division occupied the line of heights from near the mines to west of Tapu. Colonel Gurko with 7 squadrons, the advance guard of the First Siberian Corps, made a demonstration from Liulinkou against these heights, and 4 batteries of the First Siberian Corps, from near the same village, opened fire, while the infantry was pushed forward sufficiently to form a rallying point for the troops of Major-General Orlov. The latter was sent forward by

Lieutenant-General Stackelberg to again attack the Japanese with a battalion of the Two hundred and fifteenth Regiment that had assembled near Hsiaotalienkou. The First and Second East Siberian Rifle Regiments also took part in this attack, which was repulsed with heavy loss. Major-General Orlov and one of his brigade commanders, Major-General Fomin, were wounded, and the command of the Fifty-fourth Infantry Division was given to Major-General Stolitzi.

Major-General Samsonov, from near the Yentai mines, had sent one of his Cossack regiments, at 11.30 a. m., to aid Major-General Orlov. This regiment also withdrew, before the advancing Japanese, to the mines, where Major-General Samsonov was reenforced by Colonel Zapolski with 2 battalions and 4 guns from the First Siberian Corps. In withdrawing from the mines, about 6 p. m., Colonel Zapolski took up a position near Sanchiatzu and Major-General Samsonov concentrated his command at Kuchiatzu.

Toward evening a panic occurred in the troops of the Fifty-fourth Infantry Division, reassembled along the branch railway, as a result of which the greater portion reassembled during the night near the Yentai station on the main railway.

For the recapture of Manjuyama (called Niezhin Hill by the Russians) Lieutenant-General Dobrzhinski directed that the Thirty-fifth Division, assisted by the brigade of Major-General Eck, should, after a sufficient preparation by artillery fire, advance against the hill. At 8 a. m. 96 guns opened fire from east of Sahutun. In the first line from left to right there were 6 companies of the One hundred and thirty-eighth Regiment, 1 battalion of the One hundred and thirty-ninth, then the One hundred and twenty-first, supported by the remaining 6 companies of the One hundred and thirty-eighth Regiment. The One hundred and twenty-third Regiment acted as reserve to the attacking force.

The One hundred and twenty-first Regiment, about noon, reached the spur southwest of Hsikuantun, driving back 6 companies of Japanese from the Fifteenth Brigade and Fourth Regiment that had advanced to this spur in the morning and which suffered severely from the Russian artillery fire during the withdrawal. The 6 companies of the One hundred and thirty-eighth Regiment, supporting the One hundred and twenty-first, advanced to the left front along the foot of

Manjuyama, came under a cross fire of infantry aided by machine guns, and was forced back a short distance with heavy loss.

In the afternoon the troops assigned for the final assault on Manjuyama comprised, on the left flank, under Colonel Istomin, commanding the One hundred and thirty-seventh Regiment, 7 battalions drawn from three different regiments of the Tenth and Seventeenth Corps; in the center, under Major-General Vasiliev, 13 battalions drawn from both corps; on the right, 7 battalions under Major-General Eck. The artillery at Sahutun was increased, and the total number of guns taking part was finally raised to 152.

About 6 p. m. the Eighty-fifth Regiment had reached a point close to the southwestern slope of Manjuyama, still held by the Japanese Fifteenth Brigade with the Third Brigade in reserve. The Russian artillery fire ceased shortly before 7 p. m. (6 p. m. by the Japanese time), and the command of Colonel Istomin assaulted the hill and made a lodgment on the crest where held by the left of the Japanese Thirtieth Regiment. The troops from the command of Major-General Vasiliev, following slightly in rear and to the right of those of Colonel Istomin, also made a lodgment on the crest where held by the right of the Japanese Sixteenth Regiment. The attacking Russians were forced back about 200 yards, where they continued firing. About 10.30 p. m. a slight advance was made against the Japanese Sixteenth Regiment by the troops of Major-General Vasiliev.

The assaulting Russians began withdrawing in small groups toward Sahutun, and reinforcements of 5 battalions from the Seventeenth Corps and 2 from the Tenth Corps were sent forward. This force was attacked on its left flank, about 3 a. m. on September 3, by 2 battalions from the Japanese Third Brigade, and the entire Russian force fell back on Choheiyentai and Sahutun.

The Third Siberian Corps had moved to Changshutun, where it was held in reserve during September 2.

On the left bank of the Taitzu the Guards Division moved to Kouchingtzu, where it endeavored to force a crossing of the Taitzu with a view to attacking Hill 1057.

The Japanese Fourth and Second Armies completed their deployment in front of the main Russian position south and

west of Liaoyang; the artillery bombarded the position throughout the greater part of the day and the infantry gradually worked forward.

About noon a counter attack was made from the Russian right by a brigade of infantry accompanied by two batteries. The Japanese infantry made an unsuccessful attack in the morning and another about sunset.

In the early morning of September 3 Lieutenant-General Stackelberg, fearing his left was being turned by the Japanese in the neighborhood of the Yentai mines, withdrew the First Siberian Corps a short distance to the southwest and took up a position with the left resting on the branch railway. General Kuropatkin then ordered the evacuation of Liaoyang.

In the Japanese First Army the Twelfth Division remained in position. The Second Division rearranged its troops, placing the Third Brigade on the right of the Fifteenth. The Guards Division, unable to force a crossing at Kouchingtzu, was ordered to leave three batteries with an infantry support at Shuangmiaotzu and to march with the remainder to army headquarters at Kuantun.

The Russians continued to hold the heights southwest of Hsikuantun and their line in front of the Japanese First Army, and began the withdrawal of the troops holding Liaoyang.

In the Japanese Fourth and Second Armies the artillery, which had advanced closer to the Russian position during the night, opened a heavy fire at dawn. The infantry reached a line that was generally about 300 yards from the Russian position and made a series of unsuccessful attacks throughout the day. About 7 p. m. the Twentieth Brigade, Tenth Division, captured redoubt No. 2 (near Yuichuangmiao) and began working forward against the gate in the city wall.

On this day the Russian storehouses in the vicinity of Liaoyang station were destroyed by fire.

On September 4 the Second Brigade (Watanabe) of the Guards Division, which had been ordered to hasten forward, arrived at Kuantun. The fighting in that vicinity, however, had ceased, the Russians having withdrawn except from Hill 917, which was evacuated by them about 10 a. m. The Japanese First Army was ordered to pursue, but had made little progress when night came. The Guards Kobi Brigade

(Umezawa) had left a small force at Shangpingtaitzu to hold Major-General Liubavin's detachment in check and with the main body had arrived at the Yentai mines at 1 p. m. on September 3. This brigade moved north and, after a skirmish northwest of Sanchiatzu, occupied the hill east of Yumentzu about 6 p. m.

The Japanese Twelfth Division, in an endeavor to advance along the branch railway, came into contact about midnight with the First Siberian Corps near Hsiaotalienkou and was repulsed after some hand to hand fighting, with considerable loss on both sides. A Russian machine gun company took part in the engagement.

By 2 a. m. on September 4 troops from the Japanese Second Army had reached the railway station and occupied a portion of the walled city, where they assisted the troops of the Fourth Army in driving out the Russians, the street fighting continuing until about 10 a. m.

The remainder of the Russians retired across the Taitzu River, destroyed the military bridges, and burned the wood-work of the railway bridge.

On September 5 in the Japanese First Army the Guards Kobi Brigade remained in position on the hill east of Yumentzu, being opposed by the echelons of the First Siberian Corps in its withdrawal to the north on the Liufangtzu-Kushutzu road. The Twelfth Division reached a line through Taliengkou, the Second Division advanced on Lotatai, the Guards Division remained in reserve.

In the Russian army on that date the First Siberian Corps was at Hungeliatien, the Second Siberian at Lantzukai, the Third Siberian at Huanshan, the Fourth Siberian at Wulikai, the Tenth at Shahopu, the Seventeenth at Shibliho. General Kuropatkin telegraphed that his army, proceeding northward, had extricated itself from the dangerous position in which its center and left flank had faced the Japanese on a narrow front.

The Japanese reported the following casualties for the battles at Liaoyang and its neighborhood:

First Army.....	4, 866
Second Army.....	7, 681
Fourth Army.....	4, 992
Total.....	17, 539

Of these casualties there were 136 officers killed and 494 wounded.

The Russian General Staff reported 54 officers and 1,810 men killed, 252 officers and 10,811 men wounded, 5 officers and 1,212 men missing.

For the month of August (August 14 to September 13, new style), 1904, the Russian medical reports gave 91 officers killed and 477 wounded, 2,243 men killed and 15,379 wounded, this exclusive of the losses at Port Arthur.

BATTLE OF SHA RIVER.

(Plate XI.)

After the battle of Liaoyang the Japanese occupied a general front through Yentai Station and the mines, extending from the Hun River on the left eastward to Pensihu on the Taitzu River, the outposts being several miles farther north. The First Army was on the right and extended from the Yentai mines to Pensihu. The Guards Kobi Brigade (Umezawa) was in advance of the Pensihu district, which seems to have been held by weak detachments of service troops. The Guards Division was near Hsiaotalienkou, the Second Division near the Yentai coal mines, the Twelfth Division near Tapu. The Second Cavalry Brigade, under Major-General Prince Kanin, operated on the right.

The Fourth Army occupied the line from the Yentai mines to the railroad; the Second Army occupied the line to the west of the railroad. The First Cavalry Brigade, under Major-General Akiyama, was on the extreme left. A large portion of the divisional cavalry of the Japanese Second Army was under his command during the battle.

The general reserve consisted of 3 Kobi brigades and the Second Artillery Brigade, containing the Sixteenth, Seventeenth, and Eighteenth Regiments.

The only severe engagement between the opposing forces during the remainder of September was in the neighborhood of Shangpingtaitzu, where the Japanese detachment was attacked on September 17 at noon by a mixed brigade coming from the direction of Fushun and Mukden. After a severe engagement, lasting until night, the Russian force withdrew.

On October 2, 1904, General Kuropatkin issued an order

announcing his intention to take the offensive. The troops at his immediate disposal were reported to consist of 261 battalions (181,400 bayonets), 143 squadrons and sotnias, 864 guns, 32 machine guns, and 41 sapper companies. The Japanese forces confronting this army consisted practically of those organizations that had taken part in the battle of Liaoyang, and which had again been raised to full strength, and a corresponding number of Kobi organizations. The Eighth Division arrived during the battle, in which it appears to have taken part only as reserve, raising the total to from 164 to 170 battalions, 50 squadrons, 558 field and mountain guns, 10 siege guns, and 38 howitzers and mortars.

In the Russian Army the left wing, Eastern Detachment, was commanded by Lieutenant-General Stackelberg and consisted of the First, Second (Fifth East Siberian Rifle Division and Two hundred and thirteenth Infantry Regiment), and Third Siberian Corps, one brigade of the Fourth Siberian Corps, and the Siberian Cossack Division (Major-General Samsonov); 73 battalions, 34 sotnias, 164 guns, 32 machine guns, and 16 sapper companies.

The right wing, Western Detachment, was commanded by General Bilderling (Lieutenant-General Volkov was temporary commander of the Seventeenth Corps) and consisted of the Tenth and Seventeenth Army Corps; the Fifty-first and Fifty-second Dragoon Regiments; one-half of the Orenburg Cossack Division and the Ural Cossack Brigade (Major-General Grekov); 64 battalions, 26 squadrons and sotnias, 224 guns, and 8 sapper companies.

Lieutenant-General Dembovski's detachment, containing the Two hundred and fifteenth, Two hundred and sixteenth, and Two hundred and Eighty-fourth Infantry Regiments, the Twenty-eighth Artillery Brigade, the Caucasus Cavalry Brigade, the First Argunsk Cossack Regiment, the Fourth Transbaikal Cossack Battery (12 battalions, 16 sotnias, 32 guns, and 2 sapper battalions) was on the right bank of the Hun and operated in conjunction with the Western Detachment in the later stages of the battle.

The Sixth Siberian Corps (Lieutenant-General Sobolev, 32 battalions, 8 sotnias, 96 guns, and 3 sapper companies) was between Tiehling and Mukden, and became a part of the Western Detachment in the later stages of the battle.

The general reserve consisted of the First Army Corps and the Fourth Siberian Corps (less one brigade); 56 battalions, 6 sotnias, 230 guns, and 7 sapper companies.

Major-General Mishchenko's Transbaikal Cossack Brigade, containing 23 sotnias and 8 guns, operated in front of the general reserve and connected the two wings in the early stages of the battle.

On the extreme right was the Liao River Detachment, commanded by Major-General Kossagovski and containing the Two hundred and eighty-first Infantry Regiment, Fourth Siberian Infantry Regiment, Amur Cossack Regiment; 6 battalions, 3 sotnias, and 12 guns.

On the extreme left was Lieutenant-General Rennenkampf with a mixed command (Eck, Pieterov, and Liubavin) consisting of troops from the Fifty-fourth and Seventy-first Infantry Divisions and the Second Brigade (Liubavin) of the Transbaikal Cossack Division; 14 battalions, 18 sotnias, 32 guns, and 1 sapper company.

There was also a detachment under Colonel Madritov, still farther east, containing 1 battalion and 6 sotnias, operating against Saimachi.

The effective strength of the Russian army was about 200,000; that of the Japanese, about 170,000.

The Russian plan was to move forward on the left, seize Pensihu, and then advance down the valley of the Taitzu against the Japanese prepared positions in the Yentai region. On the right General Bilderling was to advance along the Mandarin road and the railway toward Liaoyang. General Mishchenko was to maintain communications between the wings and was to be followed by the general reserve. In the Western Detachment each echelon was to intrench each position occupied.

The Russians advanced in several columns on a front reaching from west of the railway east to Fushun, and drove in the Japanese outposts after some skirmishing, in which the losses were slight on both sides. On October 6 they reoccupied Shaho station, and their railway troops restored the bridge over the Sha River the next day.

At dusk on October 7 Umezawa's brigade began to withdraw from the vicinity of Piemiulupu and arrived at Liu-

shakou the next morning. Two companies were stationed at Tumentzuling, 3 battalions and 4 guns at Taling, and 1 regiment and 2 guns were sent to the range of heights separating Pensihu from the small river flowing into the Taitzu near Weiningying. Before the arrival of the latter detachment the advance guard of Rennenkampf's force had driven back a Japanese outpost on the height west of Weiningying.

In the evening of October 8 the Twelfth Japanese Division was ordered to march (it was then near Wangkouyuling) farther east, and the division commander, Lieutenant-General Inouye, was placed in command of troops in the Pensihu district.

On October 9 one brigade of Eck's division and Liubavin's Cossack brigade of Rennenkampf's command crossed the Taitzu River at Weiningying, cut the communications of the troops at Pensihu and vicinity with their base at Hsihoyen, and intrenched. In the Eastern Detachment the Third Siberian Corps was at Kaotaitzu attacking the heights to the west; the First was at Hsiaoshihchiaotzu, with advance guards near Taling and Tumentzuling; the Second was at Piennilupu. General Mishchenko was at Tapu; the Fourth Siberian Corps was at Haniutun, with advance guards at Mienhuapu and Hsiaoliuhotzu. Lieutenant-General Zaruhaiev, with three-fourths of the Fourth Siberian Corps, was given command also of Mishchenko's troops and the left brigade of the Third Division (Lieutenant-General Mau), Tenth Corps, and began to intrench. Two regiments of the Fourth Siberian Corps intrenched east of Hanlashantzu, one south of Shangliuhotzu, and two southwest of Pachiatzu and Mienhuapu. General Mau's brigade was in echelon back of the right flank of this line on the heights northwest of Sanchiatzu, and General Mishchenko's brigade was sent to Mienhuapu to maintain communication with the Eastern Detachment. The First Army Corps was in the Erhtaokou region.

The advance troops of the Tenth Corps occupied Kushutzu and the hill to the west after a short skirmish. The main body was on the Shihli River. The Seventeenth Corps also was at the Shihli River to the west of the Mandarin road, advance troops occupying Wulitaitzu and Erhtaitzu. General Grekov's division was in the neighborhood of Tatungshanpu. The Sixth Siberian Corps, which concentrated near Tasu-

chiapu, Laishengpu, and Tatai on the 7th, advanced about 2 versts and sent one brigade as advance guard to Hsiao-shuluitzu. The First Brigade of the Fifty-fifth Division was occupying Tiehling and Mukden. Lieutenant-General Dembovski was at Changtan.

In addition to the severe fighting near Pensihu on October 9, there were numerous skirmishes along the entire line of the opposing armies. On the night of the 9th the First Siberian Corps began the attack on Taling and Tumentzuling, one brigade on each pass.

On October 10 the severe fighting continued in the neighborhood of Pensihu. The Russians in a night attack assaulted and carried the height west of Weiningying and the one east of the road leading from Pensihu to Hualienkou. They also continued the attack on Taling and Tumentzuling and opened an artillery fire on the Second Division, to which the Japanese artillery replied. Liubavin's brigade, from the south bank of the Taitzu, endeavored to cross and advance against the heights southwest of Pensihu. The Japanese Second Cavalry Brigade was ordered to March from Huiyao to Hsihoyen.

The Japanese Fourth and Second Armies began to advance, skirmishing with the opposing Russians. In the Fourth Army the Tenth Division occupied the heights east of Yumentzu; the left of the Fifth Division, in conjunction with the right of the Third Division, Second Army, attacked Wulitaitzu. The reserve division, of 3 Kobi brigades, was on the right of the Fifth Division. In the Second Army the left of the Third Division and right of the Sixth Division occupied Erhtaitzu, the left of the Sixth Division occupied Tatungshanpu. The Fourth Division, after some skirmishing, reached the vicinity of Yangchiachiantzu. The First Cavalry Brigade was at Chentanpu with a detachment at Heikoutai.

Of the Russian troops on this part of the field the Seventeenth Corps withdrew its advanced troops from Erhtaitzu and Tatungshanpu to the line Shihliho-Entehniulu-Hsiao-tuntai, holding this line with the Third Division and keeping the Thirty-fifth Division in reserve near Liutunkou. Major-General Grekov's Cossack division was near Litajentun. Colonel Stakhovich, commanding the Fifty-second Dragoon

Regiment, who was reenforced several times during the battle by detachments of infantry, connected the right of the Seventeenth Corps with the left of Grekov's division.

The movements of the Japanese on October 10 had followed an order, issued by Marshal Oyama at 10 p. m. on October 9, in which he said:

I shall attack the enemy before he completes his deployment and drive him back to the line Kangtolishan-Fengchiapu-Litajentun. The Twelfth Division and the Guards Kobi Brigade will advance on Hsiaoshihchiaotzu, and the main body of the First Army on Fengchiapu as soon as Wulitaitzu, on the Mandarin road, has been captured by the Fourth Army. The latter will march on the morning of October 10 in the direction of Ninkuantun; the Second Army against the line Panchiaopu-Litajentun. The latter will place strong reserves in rear of its right flank. The left wing will advance more rapidly than the right and undertake an enveloping movement.

On October 11 the Japanese in the forenoon recaptured the heights east of Pensihu and the one east of the road near Hualienkou. The Russians returned to the attack in this region and extended the severe fighting to the Taling and Tumentzuling regions, the First Siberian Corps reenforcing its first line. The Second Siberian Corps was in reserve at Hsiaoshihchiaotzu.

There was but little change in the relative positions of the Japanese First Army and the opposing Russians except on the extreme left of the former where the Fifteenth Brigade, moving in conjunction with the right of the Tenth Division, captured Temple Hill (also Sanchiatzu toward night) and repulsed the Russian counter attack made shortly after dark. The Tenth Division attacked Sankuaishihshan, held by a portion of the brigade of the Thirty-first Division under General Mau.

This reverse to the right flank of General Zarubaiev's line caused a suspension of the intended attack by the Russian Tenth Corps on Kushutzu and the height about 1 mile farther west, out of which positions the advance guard of the Tenth Corps had been driven that morning. The Japanese had begun to advance from these points and thus met the attack of the Tenth Corps. The One hundred and thirty-eighth Regiment and two batteries of the Thirty-fifth Artillery Brigade had been sent to Shihliho to assist the Tenth Corps, permitting the latter to use its entire reserve in strength-

ening the main line on the Shibli River, and extending it toward the right of General Mau's brigade at Yingpan.

In the Japanese Second Army the left of the Third Division and the division reserve attacked the Entehniulu section from Tsaotaitzu and Erhtaitzu. The first assault, about 2 p. m., failed. A second assault was made and the village captured about 5 p. m.; the assaulting troops, having been reenforced from the army reserve, also carried Hsiaolankou. The Sixth Division occupied Yangchiawan, from which Colonel Stakhovich withdrew to Peiyentai, about noon and the Fourth Division occupied Sanchiatzu, with a detachment near Tatai where occurred a skirmish with a detachment of the Sixth Siberian Corps, the main force of which was now on the line Talientun-Hsiaosholuitzu. General Grekov's cavalry had withdrawn to the north and west to meet the movements of the Japanese First Cavalry Brigade.

During the night of October 11 General Zarubaiev intrenched his main line on the heights north of Shangliuhotzu and Hsiaoliuhotzu. The Seventeenth Corps commander, General Volkov, sent from his reserve the One hundred and thirty-ninth Regiment and two battalions of the One hundred and fortieth Regiment against Entehniulu. This force carried the village by a bayonet charge about 11 p. m., inflicting severe loss on the Japanese Thirty-third Regiment. The Japanese intrenched near the eastern and southern outskirts of the village.

The Second Brigade of the Fifty-fifth Division, Sixth Siberian Corps, was sent to Lintunkou during the night and placed under the commander of the Seventeenth Corps, the reserve of which had been depleted by the detachment sent against Entehniulu.

NOTE.—The various movements that had taken place left the distribution of troops on the Russian right flank as follows:

On the line Talientun-Hsiaosholuitzu was the main force of the Sixth Siberian Corps.

Under Colonel Stakhovich, at Peiyentai, were the Fifty-second Dragoon Regiment, 2 battalions of the One hundred and fortieth Regiment, one-half battalion of the Eleventh Regiment, 1 battery of the Thirty-fifth Artillery Brigade, 2 guns of the Third Artillery Brigade, and a volunteer detachment from the Tenth Regiment.

General Grekov's cavalry prolonged the line to the west through Peilintai, and the troops under Dembovski were at and near Changtan.

In the section Hsiaotuntai-Tuntai-Lantzukai were 1 battalion of the One hundred and thirty-seventh Regiment, 2 battalions of the Tenth Regiment, the Ninth Regiment, 6 companies of the Twelfth Regiment, and 2 batteries of the Third Artillery Brigade.

In Entehniulu was the One hundred and thirty-ninth Regiment. On the north bank of the Shihli River at this village and in Lunwanmiao were 2 battalions of the One hundred and fortieth Regiment and 1 battalion of the Tenth Regiment.

Between Lunwanmiao and Shihliho were $1\frac{1}{2}$ battalions of the One hundred and thirty-eighth Regiment, 2 battalions of the Twelfth Regiment, and 2 batteries of the Third Artillery Brigade.

In Shihliho were $2\frac{1}{2}$ battalions of the Eleventh Regiment, 6 companies of the One hundred and thirty-eighth Regiment, 2 companies of the Twelfth Regiment, 3 batteries of the Thirty-fifth Artillery Brigade, and 2 batteries of the Third Artillery Brigade.

At Wulikai were 1 battalion of the One hundred and thirty-eighth Regiment and 2 squadrons of the Fifty-first Dragoons.

In the Seventeenth Corps reserve at Liutunkou were 3 battalions of the One hundred and thirty-seventh Regiment, 4 batteries of the Thirty-fifth Artillery Brigade, and, after 10 a. m. on the 12th, the Second Brigade of the Fifty-fifth Infantry Division, Sixth Siberian Corps.

On October 12 the severe fighting continued with but little change in the relative positions of the two combatants in the neighborhood of Pensihu, Taling, and Tumentzuling. The Japanese Second Cavalry Brigade, with its machine-gun company defeated Liubavin's infantry reserve near Taotingshan, and thus greatly aided the Japanese in the neighborhood of Pensihu, who up to this time had been hard pressed.

Beginning in the early morning the Guards Division carried the heights south, and later those north, of Pachiatzu. Colonel Kasa, with the Guards and Second Division cavalry regiments, was sent to Mienhuapu to protect the rear and right flank of the Guards from the troops of Mishchenko, who had fallen back to Sikou.

In the Japanese Second Division the Third Brigade in the early morning completed the capture of Sanjoshishan and the entire division attacked the heights of Hsiaoliuhotzu and Shaotaku, the Fifteenth Brigade being directed against Rokoshan.

In the Japanese Fourth Army the Tenth Division and 3 Kobi brigades captured Sankuaishihshan in the early morning, relieved the Thirtieth Regiment, Second Division, at Nanshan, and made an unsuccessful night attack on Shiroyama. In front of the Russian Tenth Corps the Japanese confined

their efforts to an artillery fire. The Russian troops from Sankuaishihshan halted on the main line from the hill south of Hamatan to Tsaichiatun. The detachments of Yingpan and Takou retired to Shingchuang. By night the main position of the Tenth Corps was Hunpaoshan-Ninkuantun.

In the Japanese Second Army the right of the Third Division attacked Shihliho and Wulikai station at daybreak; the left of the Third Division and right of the Sixth Division attacked Entehniulu; the left of the Sixth Division attacked Tuntai. The Fourth Division, reenforced from the army reserve, operated against the detachment of Colonel Stakhovich at Peiyentai and, in conjunction with the First Cavalry Brigade, against the cavalry of General Grekov farther west.

The attack of the Third and Sixth Divisions made little progress until about 10 a. m. The Fourth Division had gained ground so as to attack Peiyentai from the south and west, and this enabled the left of the Sixth Division to advance to the junction of the two streams north of Hsiaotuntai. Utilizing the valley of the creek coming from Chengchia, the Sixth Division continued its advance and captured Lantzukai and the 16 guns of the First and Second Batteries of the Third Artillery Brigade shortly before noon. Two unsuccessful attempts were made by the Russians to recapture the guns. The first attempt was made by the troops of the Lantzukai-Tuntai section; the second was made about 12.30 p. m. by the Two hundred and nineteenth Regiment from Chengchia and 1 battalion of the One hundred and thirty-eighth Regiment from Wulikai. In repulsing these attacks the Sixth Division was aided by a reserve brigade which arrived from the Second Army reserve and crossed the Shihli River at Tuntai to move on Liutunkou. This brigade was brought to a stand on the right bank of the river and bivouacked near Tuntai.

In the meantime the Third Division had made two unsuccessful assaults on Shihliho and Entehniulu, the first about noon, the second about 2.30 p. m.

At 3.50 p. m. General Volkov issued an order directing his troops to hold their positions until dark and then to retire. The Thirty-fifth Division was to occupy the line Panchiaopu-Chengchia, its left connecting with the Tenth Corps, the Third Division in reserve at Shulingtzu; the brigade of the

Fifty-fifth Division to extend the line from Chengchia toward Hunlinpu; the detachment of Colonel Stakhovich to hold Hunlinpu and connect with the main body of the Sixth Siberian Corps. The progress of the battle, however, prevented the execution of this order. The capture of Lant-zukai facilitated the operations of the Japanese Third Division, which by sunset had carried Panchiaopu and Wulikai. The right of this division, in conjunction with the left of the Fifth Division, captured 4 guns of the Russian Third Artillery Brigade west of Shihliho during the afternoon. The disaster to the Seventeenth Corps caused the Tenth Corps to withdraw during the night from the Hunpaoshan-Ninkuantun position.

The Japanese Fourth Division drove the detachment of Colonel Stakhovich from Peiyentai and occupied that village about 4 p. m. A Russian detachment from the Sixth Siberian Corps, coming from Wangchuanqtzu, attacked the Japanese at Tapingchuan and Litajentun, compelling the Japanese to reenforce the troops at the latter village by a detachment from the First Cavalry Brigade.

On October 13 the Japanese in the Pensihu region found that the Russians in their front had retired during the night, Rennenkamp's command having withdrawn up the valley of the Taitzu, the Third Siberian Corps to Lichiawoping en route to Kaotuling. Matsunaga's brigade, Second Division, attacked Chaohsienling, to which point it had marched the preceding night, and where it was in turn attacked by the Russians and hard pressed until the arrival of reenforcements. In the Guards Division the right brigade penetrated to the height south of Maerhshanputzu. Here it was attacked by a detachment of the Second Siberian Corps, advancing by way of Maerhshanputzu, and by a detachment from the left of the Fourth Siberian Corps, the main force of which was attacking the left brigade of the Guards Division on the southern portion of Maerhshan. A portion of the latter attack penetrated the interval between the two brigades, but was brought to a stand by the Fourth Guards Infantry, then in the division reserve, which succeeded in holding the small hill southwest of Houchiatumankou.

Colonel Kasa's detachment and the Third Regiment, Guards Division, occupying the heights from east of Nankou

to west of Sikou, repulsed a Russian attack from Waitoushan. The Japanese Fifth Division, less one regiment, was sent from Kushutzu to Sanchiatzu and placed under the commander of the First Army. The Fifteenth Brigade, Second Division, carried the heights of Rokoshan and Shiroyama and then the ridge from Shiroyama to Yangchenchai, where it repulsed a night attack.

This night attack covered the withdrawal of the Fourth Siberian Corps to the right bank of the Sha River. The Thirty-seventh Division, First Army Corps, had been placed in the line between the Fourth Siberian and the Tenth Army Corps on the 10th, and with the Twenty-second Division, First Army Corps, remained on the left bank of the Sha River.

In the Japanese Fourth Army the Tenth Division and three Kobi brigades advanced as far as Manchafin and Huchiakuchiatzu, the opposing Thirty-seventh Division falling back to the line of heights north of Hamatan, east of Tungshankou and north of Tungshantzu. A detachment from the left of the Fourth Army attacked toward Huanhuation; otherwise the action of this army against the various positions held by the Tenth Corps was limited to artillery fire.

In the Japanese Second Army the Third Division, reinforced by a regiment of infantry and one of artillery, turned to the right and attacked Huanhuation in conjunction with the left of the Fourth Army. When north of Pachiatzu the flank of the Third Division was attacked by troops of the Tenth Corps from Lamutun and Wukaontzu. The Third Division was then ordered to attack to the north but night came before the new attack was well developed. At the same time the artillery of the Sixth Division, the front of which had been cleared by the withdrawal across the Sha of the Seventeenth Corps, and one of its brigades, with the general reserve at Liutunkou, was ordered to attack Huanhuation in conjunction with the left of the Fourth Army. This attack, also, was but slightly developed when night came. The other brigade of the Sixth Division occupied Shulingtzu about 11 a. m. and at sunset was confronting the Russians at Lamutun.

The Fourth Division advanced to the line Kihsiaotun-Changlingpu and began developing toward Linshengpu. The First Cavalry Brigade concentrated at Sanchiatzu where it repulsed an attack of about 600 Russian cavalry.

To close the gap between the Eastern Detachment and the Fourth Siberian Corps, caused by the withdrawal of the latter across the Sha River, General Kuropatkin ordered two regiments of the Second and all the First Siberian Corps to move from east to west.

After withdrawal to the Sha River the Seventeenth Corps occupied a line from Lamutun through Linshengpu to Talientun; the One hundred and thirty-seventh Regiment was to the west of the railway, with 2 battalions of the One hundred and thirty-ninth Regiment as reserve; 14 companies of the One hundred and thirty-eighth Regiment held the line from the railway to Lamutun; the Thirty-fifth Artillery Brigade was between the railway and a line running from Linshengpu to Ssufangtai; the One hundred and fortieth Regiment was north of Yinkua; the greater part of the Third Division and the Third Artillery Brigade were on the line Ssufangtai-Kuchiatzu.

The various fractions that had been with Colonel Stakhovich rejoined the Seventeenth Corps during the day.

The first line of the Seventeenth Corps thus prolonged the line held by the Tenth Corps, Wukaontzu-Kuchiatzu-Changlingtzu. The Sixth Siberian Corps, which, while being in echelon behind the right flank of the Seventeenth Corps, had been a part of the general reserve of the army, was now placed under the orders of the commander of the Western Detachment and ordered to prolong the line of the Seventeenth Corps in echelon westward through Talientun and Hsiaosholuitzu. Dembovski's command was still farther to the west, apparently at and near Changtan.

For the next day an offensive movement by the Western Detachment was ordered. The Tenth and Seventeenth Corps were to hold their positions even against assault. The Sixth Siberian Corps was to advance against and capture Hunlinpu and Peilintai. Lieutenant-General Dembovski was to advance to the line Fuchiachuang-Paohsiantun-Tahantai.

On October 14 in the Japanese First Army reinforcements from Saimachi reached Hsihoyen, following a similar body that had arrived on the night of the 13th and reinforced the Twelfth Division. Detachments from the Twelfth and Guards Divisions attacked and carried the height west of Sikou. General Mishchenko's brigade and one regiment withdrew across the Sha River in front of the Guards Division, which advanced and occupied the hills south of Fengchiapu. The Fifteenth Brigade, Second Division, advanced to the heights north of Miaokou and then, after a slight engagement, to Tainshutun, the Russians withdrawing across the Sha River.

In the afternoon the Russians began withdrawing from the Chaohsienling region and were followed by the Japanese. The Japanese Twelfth Division marched on Hsiaoshihchiaotzu, being followed by the Guards Kobi Brigade; the Third Brigade, Second Division, marched on Hsiaopingtaitzu, the Second Cavalry Brigade on Hsiaochiahotzu. Of the opposing Russians the Fifth East Siberian Division was at Pien-niulupu, the First at Yangmulingtzu, the Ninth at Kangtolishan, the Third Siberian Corps at Kaotuling. The Ninth East Siberian Division, followed by one brigade of the Fifth, marched via Hsiaoyangtun to Liushihtaitzu.

The Japanese Fourth Army attacked in the directions of Hsinglungtun and Putsaoyai, subsequently reaching the Sha River.

In the Japanese Second Army one brigade of the Sixth Division, cooperating with the left of the Fourth Army, occupied the hill north of Huanhuatien and then endeavored to carry Santaokangtzu, but was unable to do so before night.

About 3.30 a. m. troops of the Third Division made an unsuccessful attack on Houchaishan, held by the Thirty-fourth and One hundred and twenty-third Regiments. About 5 a. m. an unsuccessful attack was made on Wukaontzu. About 6.30 a. m. the Third Division assaulted and, about 7.30 a. m., after very severe fighting, carried Houchaishan, thus piercing the line held by the Tenth Corps, and then Wukaontzu, north of which the Japanese captured the second group of the Ninth Artillery Brigade, 23 guns. A detachment of the Third Division continued to and occupied Shahopu about 8 a. m., the portions of the Tenth Corps in the intrenchments

between Wukaontzu and Lamutun withdrawing to the right bank of the Sha River. This Japanese detachment was brought to a stand at Shahopu by an attack of the Thirty-sixth Regiment which had rejoined the Tenth Corps from Yinkua that morning.

The Fourth Division repulsed three determined attacks by the Sixth Siberian Corps on Changlinpu, and sent a portion of its right, in cooperation with the Twenty-fourth Brigade, Sixth Division, against Linshengpu and the line leading from that village to Talientun. The Japanese carried all of Linshengpu but the northern part, and the Russians remaining on the left bank of the Sha River between the railroad and Linshengpu retired to the right bank. Six companies of Russians made a counter attack on Linshengpu, but could not advance beyond the northern outskirts of the village.

The main body of the First Cavalry Brigade concentrated at Peilintai, presumably because of Dembovski's advance.

On October 15 the main body of the Japanese First Army was at the Sha River. The Guards Kobi Brigade was ordered to march to Sanchiatzu.

The Fifth Division, which had returned to the Japanese Fourth Army, replaced the troops of the Sixth Division that were between Changlingtzu and Santaokangtzu and, in conjunction with the right of the Third Division, completed the occupation of the remaining territory in that vicinity as far as the Sha River, carrying Lone Tree Hill toward morning of the 16th and capturing 2 guns. The right brigade of the Third Division later attacked North Shahopu and, failing to drive the Russians out, remained facing their opponents, who later withdrew to the line Kuantun-Shanlantzu.

The Japanese Sixth Division concentrated on its left brigade and attacked Lamutun and the line leading from that village to Linshengpu and thence toward Talientun. After a hard fight the Japanese carried Lamutun about 5 p. m., remaining there for the night. The Japanese Fourth Division extended its left to Wangchuantzu while continuing to hold its position of the 14th. The Sixth Siberian Corps, facing the Japanese Fourth Division, prolonged the Russian line from Talientun through Chitaitzu and Sanchiatzu, and Dembovski's detachment occupied the region Fuchiachuang-Paohsiantun-Yangshulingtzu.

The First Cavalry Brigade, with one mounted battery, was attacked by the Russian cavalry near Litajentun, and retired to Tapingehuang at dark.

On October 16 there was no important engagement in front of the Japanese First Army. The Second Japanese Cavalry Brigade, after a skirmish near Kaotuling, retired to Kao-kuanchai. The Second Division concentrated near Tain-hsiangtun. A Russian detachment from the Fifth Siberian Division crossed the Sha River and occupied the heights of Waitoushan.

The Nineteenth, Twentieth, and Thirty-sixth East Siberian Regiments, and the Eighty-seventh and Eighty-eighth Regiments, First Army Corps, assisted by the fire of the Eighty-sixth Regiment, shortly after sunset assaulted and carried Lone Tree Hill (including the portion called Novgovod Hill), held by Major-General Yamada's brigade, Fifth Division, capturing 14 guns and killing over 1,000 Japanese, with a loss to themselves of about 3,000 in killed and wounded. A considerable portion of the Russian loss resulted from the fire of the Eighty-sixth Regiment, which was unable to see in the darkness the distance to which the assault had been carried.

The height was named Putilov Hill, in honor of Major-General Putilov, who commanded the Russian forces engaged in its recapture.

The new line taken up by the Fifth Division extended from near Putsaoyai to Nankangtzu.

Several unsuccessful attacks were made on Linshengpu by detachments from the Russian Seventeenth Corps assisted by its artillery, which about noon turned its fire upon Wang-chuangtzu, held by the left of the Fourth Division, which was then unsuccessfully attacked by a regiment of the Sixth Siberian Corps coming from Sanchiatzu.

The main body of the First Cavalry Brigade was at Hsiao-tai, a detachment reoccupying Litajentun.

On October 17 there was a reconnaissance by a regiment of Russians south of Pienniulupu, while the Japanese continued a desultory attack upon Waitoushan. There was no change of positions or important engagement in front of the Japanese Fourth Army until night, when the Japanese made an unsuccessful attempt to recapture Putilov Hill. In the Japanese Second Army the Third Division was strongly attacked about

11.30 a. m. After the attack, the right wing of the division remained about 600 yards, the left wing about 300 yards, from the Russians on the opposite bank of the Sha River.

About midnight Linshengpu, occupied by the left of the Sixth and right of the Fourth Divisions, was unsuccessfully attacked by about one battalion of Russians. During the day the Fourth Division, giving up Linshengpu to the left of the Sixth Division, occupied a line from Kihsiaotun to the southwest of Wangchuanztzu.

The main body of the First Cavalry Brigade remained at Hsiaotai, detachments occupying Litajentun, Chentanpu, and Heikoutai. The Russians continued intrenching the line through Talientun, Chitaitzu, and Sanchiatzu. Dembovski's detachment moved north to take position in echelon behind the Sixth Siberian Corps.

On October 18 there were some unimportant skirmishes in front of the Japanese First Army, some small attacks in the early morning against the Fourth Army, and an intermittent artillery fire in front of the Second Army, the extreme left of which was attacked about noon by about 500 infantry. The Sixth Siberian Corps occupied the line Ssufangtai-Kuanlinpu. Dembovski's detachment occupied Pienchengztzu.

On October 19 a detachment of the Guards Division drove some Russian cavalry from Shiuchiafan, and was in turn driven out by a detachment of Russian infantry. In front of the Fourth Army there was only an intermittent artillery fire. At night the troops of the Third Division withdrew from South Shahopu, abandoning one of the captured Russian guns, and took up a new position farther south and less threatened by enfilade fire from Putilov Hill. The entire Second Army was subjected to a rather severe fire shortly after sunset, but no attack followed.

On October 20 there were some slight demonstrations by the Russians to the east of Pensihu, a desultory cannonade in front of the Japanese Fourth and Second Armies, especially in the neighborhood of Shahopu, and some harassing of the First Cavalry Brigade, which retired to Litajentun.

The battle of Sha River may be said to have terminated on October 20. Engagements of greater or less severity continued to occur almost daily between the opposing armies, which continued with but little change in their relative

positions to face each other, strengthening their positions as rapidly as possible with shelter trenches and field works. From Linshengpu the line of separation ran west. The Russians continued to hold Putilov Hill and Waitoushan, both on the left bank of the Sha River, which otherwise above Linshengpu separated the opposing armies. From Pienniulupu, strongly fortified, the Russian line extended northeast and then east for a distance of about 10 miles.

The Japanese reported the capture of 709 prisoners, 45 guns, 37 ammunition wagons, 5,474 rifles, 6,920 rounds of gun ammunition, 78,000 rounds of small-arm ammunition, and various other articles.

The Russians reported the capture of 9 field and 5 mountain guns and various other articles; also the recovery of one of the guns that had been captured from them.

The Japanese reported their loss as 15,879 killed and wounded. The Russians reported their loss as 190 officers and 4,894 men killed, 861 officers and 29,531 men wounded, and 35 officers and 5,838 men missing.

Prior to and coincident with the battle of Sha River there was a demonstration by the Russians against Hsienchang, with several resulting skirmishes. The attack began on October 7 and continued without much change until about 3 a. m. on the 10th, when the Japanese detachment made an attack and drove the Russians back toward the northeast.

After the battle of Sha River the opposing armies faced each other without material change of positions and without any engagement on a large scale until the battle of Chenttanpu. There were, however, for sometime almost daily encounters of greater or less magnitude.

On October 27 a portion of the Guards Division assaulted and carried Waitoushan, capturing 2 machine guns, thus completing the occupation by the Japanese of the left bank of the Sha River in the neighborhood of Pienniulupu.

On November 24 the Japanese from Hsienchang (Ninth Kobi Brigade) attacked a Russian position near Chinghochan occupied by a portion of Rennenkampf's command. The fighting continued into the night of the 24th, and was renewed on the 25th, 26th, and 27th, when the Japanese withdrew. They were followed and attacked by the Russians about six miles farther south and were again driven back.

RAID ON YINGKOU.

Early in January, 1905, a force was concentrated, under command of Major-General Mishchenko, for a raid around the Japanese left flank.

The composition of the force was as follows:

1. The Ural-Transbaikal Cossack Division. The Ural Brigade contained the Fourth and Fifth Ural Cossack Regiments, each less one sotnia; the Transbaikal Cossack Brigade contained the First Chita Cossack Regiment and the First Verkhne-Udinsk Cossack Regiment, less one sotnia.

2. The Caucasus Cavalry Brigade, containing the Second Daghestan Regiment, 5 sotnias of the Terek-Kuban Regiment, and 4 machine guns.

3. The Fourth Division of Don Cossacks, containing the Twenty-fourth, Twenty-fifth, and Twenty-sixth Regiments.

4. The Second Independent Dragoon Brigade, containing the Fifty-first and Fifty-second Regiments.

5. Four squadrons from the Maritime Province Dragoons.

6. One sotnia of scouts, drawn from various organizations and under the commander of the expedition.

7. Four half sotnias of frontier guards.

8. Four companies of mounted scouts of 100 men each, drawn from the First Siberian Corps.

9. The First and Second Transbaikal Mounted Cossack Batteries, the Twentieth Mounted Battery, one-half of a Frontier Guard mounted battery; total 22 guns.

10. A section of sappers, mounted and attached to headquarters.

11. The train, comprising 2 ambulances, 1 column of pack litters, and 5 provision columns, containing 1,500 pack animals.

On January 8, 1905, this force moved south from Ssu-fangtai in three columns.

The right column (Major-General Samsonov) contained $16\frac{1}{2}$ squadrons and sotnias and 10 guns; the center column (Major-General Abramov) contained $16\frac{1}{2}$ sotnias, 4 companies of mounted scouts, and 6 guns; the left column (Major-General Telichev) contained $29\frac{1}{2}$ sotnias, 6 guns; the convoys, escorted by the First Chita Regiment, followed the center column; three detachments of from 35 to 40 men, charged with the destruction of the railway north and south

of Haicheng and at Tashihchiao, were attached to the left column.

On January 10 small detachments of Japanese convoying supply columns were defeated and at night a detachment cut the telegraph lines and slightly damaged the railway near Haicheng.

On the same day the advance guard occupied Newchwang, from which the Japanese garrison of 1 company and 2 squadrons withdrew.

On the 11th the Russian columns advanced on Yingkou and made an attack shortly before night, the artillery fire starting a conflagration in some of the Japanese storehouses. The attack continued until the arrival by rail of some Japanese infantry from Tashihchiao, when the Russians retired. On the 13th the Russians crossed to the right bank of the Liao River and on the 14th their right column was attacked by a Japanese force and suffered considerable loss. On the 15th the retreating Russians gained contact with the Fourteenth Division, Eighth Corps, that had been sent to their assistance.

During the raid the Russians captured 1 officer, 14 men, and about 500 provision carts. They reported their losses as 39 officers and 331 men killed, wounded, and missing.

BATTLE OF CHENTANPU OR HEIKOUTAI.

(Plate XII.)

At the battle of Chentanpu (Sandepu) the Second Russian Army, commanded by General Gripenberg and forming the extreme Russian right, consisted of the Tenth, Eighth, and First (Siberian) Corps; the First, Second, and Fifth European Rifle Brigades, forming a Rifle Corps; a mixed force, under Major-General Kossagovski, consisting of two regiments of infantry, 22 squadrons, and 2 horse batteries; 8 regiments of cavalry and 4 horse batteries under Major-General Mishchenko; a total of about 84,000. The Tenth and Eighth Corps extended from Yamandapu westward to and across the Hun River, passing south of Shoukuanpu, with the Fourteenth Division, Eighth Corps, on the right bank of the Hun; the First Siberian Corps was west of the Hun River, in the vicinity of Ssufangtai; Kossagovski's command was on its

right and Mishchenko's command still farther west at Tahoangchipu, with reconnoitering detachments reaching to the Liao River; the Rifle Corps was in reserve.

The general movement, a wheel to the left with the Tenth Corps as a moving pivot, began on January 24, 1905.

General Mishchenko moved in two columns south to near Mamikai, where he was joined by General Kossagovski, who had marched direct from Ssufangtai. The Japanese outposts in the various villages retired on the approach of the Russians and but little resistance was encountered.

The First Siberian Corps, First Division on the right, advanced to the Hun River. The First Division occupied Huanlotaitzu after a preliminary bombardment, and the Ninth Division occupied Toutaitzu by a night assault; neither division encountered serious resistance.

The Eighth Corps drove in the Japanese outposts.

On January 25 the batteries with Mishchenko and Kossagovski bombarded Chitaitzu and Mamikai until night, when the two villages were assaulted and captured by Kossagovski's infantry.

In the First Siberian Corps, the First Division captured Toupao and Shihtsia, while the Ninth Division captured Heikoutai and Erhchiahotzu. The Eighth Corps continued its slow advance to the southward and was joined in the movement by the right of the Tenth Corps.

The Japanese Eighth Division and one Kobi brigade, sent from the Manchurian army reserve, arrived on the night of the 25th at Tatai. Later the Fifth Division from near Yentai and the Second Division and one Kobi brigade from the Japanese First Army were sent to reenforce the Japanese left. Major-General Akiyama, with the First Cavalry Brigade and parts of the divisional cavalry of the Second Army, was near Hsiaopeiho, having a portion of his command on the right bank of the Hun River.

On January 26 Mishchenko with his left column continued his advance as far as Hsiuerhpu, capturing several villages. His right column remained facing the Japanese First Cavalry Brigade. Kossagovski's force remained on the Hun River. One of the Rifle Brigades was placed in the first line on the left of the First Siberian Corps.

At 8 a. m. the Eighth Corps opened artillery fire on Chentanpu; toward midnight the Fourteenth Division assaulted from the west and carried the adjacent villages Baotaitzu and Hsiaoshutzu; the Fifteenth Division carried Peitaitzu, and the Tenth Corps carried Huanchi and Hsinshantun. The Japanese set fire to buildings, opened a heavy infantry and machine-gun fire, and made a series of attacks, driving the Russians from Baotaitzu and Hsiaoshutzu. One brigade of the First Siberian Corps, that was to move past the north side of Tatai and assault Chentanpu from the south, was attacked and checked by the Kobi brigade of the Tatai force moving from Kuchentzu. The Russian brigade then moved north to near Malengtzu, where it was placed in line by the commander of the Eighth Corps.

In the meantime the left wing of the Tatai force had deployed along the Sumapu-Shihtsia line to attack the First Siberian Corps on the Toupao-Heikoutai line, directing the heaviest attack against Toupao. At the same time the right wing attacked on the Laochiaio-Sumapu line, but was able to make but little progress.

On January 27 Mishchenko, driving back the opposing Japanese, advanced against and attacked Langtungkou, but was repulsed. Receiving a wound in the knee during this attack, General Mishchenko turned the command of his column over to Major-General Grekov. This attack disclosed the movements of the Japanese Fifth and Second Divisions and one Kobi brigade moving northward toward Heikoutai and Chentanpu.

The Second Division turned west to oppose Mishchenko's command, and succeeded in reaching a line through Chinchiaowopeng-Chenshao, where it was brought to a stand. The Fifth Division attacked the Liutiaokou-Hsiuchenghotzu line, from which the Russians were threatening the right and rear of the Eighth Division and the left of the main line at Chentanpu.

The right wing of the Japanese Eighth Division gained a little ground to the north, and its Kobi brigade, from Kuchentzu, then advanced, coming on the line between the two wings of the Eighth Division. The extreme left of the Eighth Division, enveloped by Kossagovski's command, suffered severely and was driven back from Shihtsia to Sanchienpao. During

the night of the 27th the Russians continued the attack on the Eighth Division, particularly at Sumapu, which was captured by an assault of the Ninth Division, the Thirty-fourth Regiment entering the village from three sides.

On the other hand the Japanese carried out a succession of strong attacks in the neighborhood of Chentanpu and Heikoutai.

On January 28 the Japanese Fifth Division continued its attack, occupying Liutiaokou at 9.30 a. m. and Hsiuchenghotzu about 3 p. m.

The Japanese Eighth Division and its Kobi brigade continued its attack against Heikoutai and Sumapu. At the latter village a detachment of the Thirty-fourth Regiment, that had captured the village on the preceding night, remained after the adjacent portions of the Russian line had been driven back, was surrounded, and, after a desperate resistance, surrendered about 200 prisoners. The extreme left of the Japanese Eighth Division recaptured Shihhsia, from which it had been driven the preceding day. The Japanese Second Division drove back its opponents of General Grekov's cavalry and Kossagovski's infantry and occupied Hsiuerhpu about 3 p. m., and a little later drove the Russians from and occupied Haerhpu.

The Russian forces concerned state that their retrograde movements of the 28th were taken up in obedience to orders received that day from Manchurian army headquarters.

During the day the Russian Tenth Corps carried Hsiao-taitzu and Yapatai.

The Japanese continued their attack during the night and by 9.30 a. m. on the 29th had recaptured Heikoutai, detachments continuing to and occupying Toutaitzu and Huanlotaitzu. The Second Division advanced as far as the Hun River, occupying Chitaitzu and Sanchiapu. Troops from Hsiuchenghotzu crossed the Hun and reached a point 1,000 yards south of Changtan. On the 30th the fighting continued on a smaller scale, the Russians continuing to bombard Chentanpu. On the 31st the Japanese attacked and carried Changtanhonan, but were driven out by a counter attack. At noon on February 1 they again carried the village and successfully resisted a counter attack, although the Russians remained in close proximity to the village.

The close of the battle found the Russian troops occupying a line through Changtan and Ssufangtai, west to the Liao River.

The Russians reported a loss of 49 officers and 1,670 men killed, 378 officers and 10,746 men wounded, 25 officers and 1,277 men missing, and the capture of about 300 prisoners. The Japanese reported a loss of 842 killed, 8,014 wounded, and 526 missing, and the capture of 500 prisoners. Both sides suffered severely from frostbite.

The battle was followed by a quarrel between Generals Gripenberg and Kuropatkin, the former claiming that his turning movement was but the part of the general plan in which the Third Army was to follow the development of the turning movement by a vigorous attack on the Japanese center, while the First Army was to join in the general attack as soon as the retrograde movement of the Japanese began, and that the latter general failed to give proper support to the turning movement, successfully begun, by ordering the attack on the Japanese center.

General Kuropatkin claimed that the turning movement failed through lack of proper concert of action between the corps engaged; that a general attack would have resulted only in a waste of ammunition and was rendered inadvisable by the intense cold. General Gripenberg proceeded to St. Petersburg and laid his complaint before the Czar, by whom he is said to have been reprimanded.

BATTLE OF MUKDEN.

(Plate XIII.)

After the battle of Chentanpu the opposing armies remained facing each other without serious engagement until the battle of Mukden. There were, however, almost daily skirmishes of greater or less severity.

At the beginning of the battle the composition and arrangement from right to left of the Russian Manchurian army, commanded by General Kuropatkin, with Lieutenant-General Sakharov as chief of staff, were as follows:

I. Second Army, General Kaulbars; chief of staff, Lieutenant-General Ruzski.

(a) West Detachment, *Rennenkampf*: The Ural-trans-baikal Cossack Division (*Rennenkampf* followed by Grekov),

composed of the First Brigade, containing the Fourth and Fifth Ural; the Second Brigade, containing the First Verkhne-Udinsk and First Chita; the Caucasus Brigade, containing the Second Daghestan and Second Terek-Kuban; 2 batteries of horse artillery, and 4 machine guns.

A mixed brigade (Kossagovski), containing the Two hundred and fifteenth and Two hundred and forty-first Regiments drawn from the Fifth Siberian Corps.

(b) The Rifle Corps (Kutnievich): First Division, containing First, Second, Third, and Fourth Regiments, and 3 batteries; Second Division, containing Fifth, Sixth, Seventh, and Eighth Regiments, and 3 batteries; Fifth Division, containing Seventeenth, Eighteenth, Nineteenth, and Twentieth Regiments, and 3 batteries; one-third of the First Orenburg Cossack Regiment from the Tenth Corps.

(c) The Eighth Corps (Milov): Fourteenth Infantry Division (Rusanov), containing Fifty-third to Fifty-sixth Regiments, and the Twenty-ninth Artillery Brigade of 6 batteries; Fifteenth Infantry Division (Ivanov), containing Fifty-seventh to Sixtieth Regiments, and the Forty-first Artillery Brigade of 6 batteries; one-third of the First Orenburg Cossack Regiment from the Tenth Corps; the Twelfth Sapper Battalion.

(d) The Tenth Corps (Tserpitski): Ninth Infantry Division (Herschelmann), containing Thirty-third, Thirty-fifth, and Thirty-sixth Regiments, and the Ninth Artillery Brigade of 6 batteries; Thirty-first Infantry Division (Mau), containing One hundred and twenty-first to One hundred and twenty-fourth Regiments, and the Thirty-first Artillery Brigade of 6 batteries; one-third of the First Orenburg Cossack Regiment; Ninth and Tenth East Siberian Mountain Batteries; Sixth Sapper Battalion.

(e) The First Siberian Corps (Gerngross): First East Siberian Rifle Division (Gerngross), containing the First to Fourth Regiments, and the First East Siberian Artillery Brigade of 4 batteries; Ninth East Siberian Rifle Division (Kondratovich), containing the Thirty-third to Thirty-sixth Regiments, and Ninth East Siberian Artillery Brigade of 4 batteries; Second Brigade, Twenty-third and Twenty-fourth Regiments, of the Sixth East Siberian Rifle Division; the

Primorski Dragoon Regiment; the First East Siberian Sapper Battalion.

II. The Third Army, General Bilderling in temporary command; chief of staff, Lieutenant-General Martson:

(a) The Fifth Siberian Corps (Dembovski): Fifty-fourth Infantry Division (Artamanov), containing Two hundred and thirteenth, Two hundred and fourteenth, and Two hundred and sixteenth Regiments, and the Twenty-eighth Artillery Brigade of 6 batteries; Sixty-first Infantry Division (Podmalniuk), containing Two hundred and forty-second, Two hundred and forty-third, and Two hundred and forty-fourth Regiments, and the Fortieth Artillery Brigade of 6 batteries; Thirty-fourth Regiment from the Tenth Corps; two-thirds the Argansk Cossack Regiment; Fifth East Siberian Sapper Battalion.

(b) The Seventeenth Corps (Selimanov temporarily): Third Infantry Division (Orlov), containing Ninth to Twelfth Regiments, and the Third Artillery Brigade of 6 batteries; Thirty-fifth Infantry Division (Dobrzhinski), containing One hundred and thirty-seventh to One hundred and fortieth Regiments, and the Thirty-fifth Artillery Brigade of 6 batteries; the Fifty-first and Fifty-second Dragoon Regiments; Seventeenth Sapper Battalion.

(c) The Sixth Siberian Corps (Sobolev): Fifty-fifth Infantry Division (Laiming), containing Two hundred and seventeenth to Two hundred and twentieth Regiments, and the Tenth Artillery Brigade of 6 batteries; Tenth Orenburg Cossack Regiment; Sixth Sapper Battalion.

III. First Army, General Linevich; chief of staff, Lieutenant-General Kharkevich.

(a) First Corps (Meyendorf): Twenty-second Infantry Division (Kutnievich, with rifle corps), containing Eighty-sixth, Eighty-seventh, and Eighty-eighth Regiments, and Seventh Artillery Brigade of 4 batteries; Thirty-seventh Infantry Division, containing One hundred and forty-fifth, One hundred and forty-seventh, and One hundred and forty-eighth Regiments, and the Forty-third Artillery Brigade of 6 batteries; Second Brigade, Nineteenth and Twentieth Regiments, of the Fifth East Siberian Rifle Division, and 3 Transbaikal horse batteries; one-half of the Second Verkhne-Udinsk Cossack Regiment; First Sapper Battalion.

(b) Fourth Siberian Corps (Zarubaiev): Second Infantry Division (Levestan), containing Fifth to Eighth Regiments, and First Siberian Artillery Brigade of 4 batteries; Third Infantry Division (Kossovich), containing Ninth to Twelfth Regiments, and 2 batteries of the Twenty-sixth Artillery Brigade; two-thirds of the Seventh Siberian Cossack Regiment; Fourth East Siberian Sapper Battalion.

(c) Second Siberian Corps (Zasulich): Fifth East Siberian Rifle Division (Alexiev, with Eastern Detachment), containing Seventeenth and Eighteenth Regiments and Fifth East Siberian Artillery Brigade of 4 batteries; First Siberian Infantry Division (Morosov), containing First to Fourth Regiments and the Sixth East Siberian Artillery Brigade of $3\frac{3}{4}$ batteries, one-third of the Seventh East Siberian Cossack Regiment and the Fifth and Seventh East Siberian Mountain Batteries; Second East Siberian Sapper Battalion.

(d) Third Siberian Corps (Ivanov, Kashtalinski temporarily): Third East Siberian Rifle Division (Kashtalinski), containing Tenth, Eleventh, and Twelfth Regiments and the Third East Siberian Artillery Brigade of 4 batteries; Two hundred and eighty-fourth Regiment from the Seventy-first Infantry Division; the Siberian Cossack Division (Samsonov), containing Fourth, Fifth, and Eighth Regiments and the Third, Fourth, and Sixth East Siberian Mountain Batteries.

(e) East Detachment (Alexiev, then Rennenkampf): The First Brigade, Twenty-first and Twenty-second Regiments of the Sixth East Siberian Rifle Division (Danilov); Ninth East Siberian Rifle Regiment, Two hundred and eighty-first and Two hundred and eighty-second Regiments of the Seventy-first Infantry Division (Eck); the Transbaikal Cossack Division (Baumgarten), containing the Second Chita, the Second Nerchinsk, the Second Argunsk, the Fourth Transbaikal Horse Battery, 8 machine guns, and 1 Transbaikal Cossack battalion; 4 batteries from the Twenty-sixth Artillery Brigade and 1 battery from the Eleventh East Siberian Artillery Brigade. A flank detachment (Major-General Maslov), containing the Sixth, Seventh, Ninth, and Tenth Siberian Reserve Battalions, 2 squadrons, and 2 guns, was at Hsingking.

A flying detachment (Colonel Madritov), containing 1 Transbaikal Cossack battalion, 5 squadrons drawn from the Amur, Argunsk, and Ussuri Cossack Regiments, the

Eighth East Siberian Mountain Battery of 4 guns, was at Tunghuahsien.

IV. General reserve.

(a) Sixteenth Corps (Topornin): Twenty-fifth Infantry Division (Pnevski), containing Ninety-seventh to One hundredth Regiments and the Twenty-fifth Artillery Brigade of 6 batteries; the First Brigade, One hundred and sixty-first and One hundred and sixty-second Regiments of the Forty-first Division (Birger), and 3 batteries of the Forty-fifth Artillery Brigade; Sixteenth Sapper Battalion.

(b) The Seventy-second Division (Tupan-Mirza-Baranovski) from the Sixth Siberian Corps, containing the Two hundred and eighty-fifth to Two hundred and eighty-eighth Regiments and the Sixth Artillery Brigade of 6 batteries; One hundred and forty-sixth Regiment from the First Corps; one-third of the Amur Cossack Regiment.

The Second Brigade of Birger's division, the Don Cossack Division, the Ussuri Cossack Regiment, and 1 Frontier Guard regiment were sent north shortly before the battle to guard the railway.

The Ninth and Tenth Rifle Regiments arrived during the battle.

There were about 250 heavy guns and 88 machine guns distributed along the line, the heavy guns being concentrated almost entirely near the railway and opposite Chentanpu and Litajentun.

The total force taking part in the early stages of the battle is taken at 370 battalions, 127 squadrons and sotnias, 1,192 field and mountain guns, 250 heavy guns, and 88 machine guns.

The total effective strength is estimated at 375,000.

The composition and order from right to left of the Japanese Manchurian army, commanded by Field Marshal Oyama, with General Kodama as chief of staff, were as follows:

1. Fifth Army, General Kawamura; chief of staff, Major-General Uchiyama.

(a) Eleventh Division (Samejima), composed of Tenth Brigade, containing Twenty-second and Forty-fourth Regiments, and Twenty-second Brigade, containing Twelfth and Forty-third Regiments, Eleventh Cavalry Regiment, and Eleventh Artillery Regiment.

(b) The Second, Fourth, and Ninth Kobi Brigades, containing 14 or 20 battalions.

Total, 26 or 32 battalions, 3 squadrons, and 36 guns.

II. First Army, General Kuroki; chief of staff, Major-General Fujii.

(a) Guards (Asada), composed of the First Brigade, containing the First and Second Regiments; the Second Brigade, containing the Third and Fourth Regiments; the Guards Cavalry Regiment, and Guards Artillery Regiment.

(b) Second Division (Nishishima), composed of the Third Brigade, containing the Fourth and Twenty-ninth Regiments; the Fifteenth Brigade, containing the Sixteenth and Thirtieth Regiments (the Sixteenth Regiment was at army headquarters); the Twelfth Cavalry Regiment, and Twelfth Artillery Regiment.

(c) Twelfth Division (Inouye), composed of the Twelfth Brigade, containing the Fourteenth and Forty-seventh Regiments; the Twenty-third Brigade, containing the Twenty-fourth and Forty-sixth Regiments; the Twelfth Cavalry Regiment, and Twelfth Artillery Regiment.

(d) Three Kobi brigades, with their cavalry and artillery.

(e) Five foot batteries.

Total, 52 battalions, 10 squadrons, and 152 guns.

III. Fourth Army, General Nodzu; chief of staff, Major-General Uyikaza.

(a) Sixth Division (Okubo), composed of the Eleventh Brigade, containing the Thirteenth and Forty-fifth Regiments; the Twenty-fourth Brigade, containing the Twenty-third and Forty-eighth Regiments; the Sixth Cavalry Regiment, and Sixth Artillery Regiment.

(b) Tenth Division (Ando), composed of the Eighth Brigade, containing the Tenth and Fortieth Regiments; the Twentieth Brigade, containing the Twentieth and Thirty-ninth Regiments; the Tenth Cavalry Regiment, and the Tenth Artillery Regiment.

(c) Eleventh and Twelfth Kobi Brigades with their cavalry and artillery.

(d) First Artillery Brigade, containing the Fourteenth and Fifteenth Regiments.

(e) Two regiments of 15 cm. mortars.

Total, 32 or 36 battalions, 7 or 8 squadrons, 180 or 192 guns, 48 mortars.

IV. Second Army, General Oku; chief of staff, Major-General Osako:

(a) Fourth Division (Tsusamoto), composed of the Seventh Brigade, containing the Eighth and Thirty-seventh Regiments; the Nineteenth Brigade, containing the Ninth and Thirty-eighth Regiments; the Fourth Cavalry Regiment, and Fourth Artillery Regiment.

(b) Fifth Division (Kigoshi), composed of the Ninth Brigade, containing the Eleventh and Forty-first Regiments; the Twenty-first Brigade, containing the Twenty-first and Forty-second Regiments; the Fifth Cavalry Regiment, and the Fifth Artillery Regiment.

(c) Eighth Division (Tatsumi), composed of the Fourth Brigade, containing the Fifth and Thirty-first Regiments; the Sixteenth Brigade, containing the Seventeenth and Thirty-second Regiments; the Eighth Cavalry Regiment, Eighth Artillery Regiment, and a battery of Russian guns.

(d) Eighth and Eleventh Kobi Brigades.

(e) First Cavalry Brigade (Akiyama), Thirteenth and Fourteenth Regiments.

(f) Heavy Artillery Brigade (Saisho), containing 6 batteries of four 15 cm. guns each, 4 batteries of six 12 cm. guns each, and 1 battery of Russian quick-fire guns.

(g) Thirteenth Regiment of Field Artillery.

Total, 44 or 48 battalions, 15 squadrons, 212 or 214 guns.

V. Third Army, General Nogi; chief of staff, Major-General Matsumago:

(a) First Division (Yda), composed of the First Brigade, containing the First and Fifteenth Regiments; the Second Brigade, containing the Second and Third Regiments; the First Cavalry Regiment, and First Artillery Regiment.

(b) Seventh Division (Oseho), composed of the Thirteenth Brigade, containing the Twenty-fifth and Twenty-sixth Regiments; the Fourteenth Brigade, containing the Twenty-seventh and Twenty-eighth Regiments; the Seventh Cavalry Regiment, and Seventh Artillery Regiment.

(c) Ninth Division (Oshima II), composed of the Sixth Brigade, containing the Seventh and Thirty-fifth Regiments;

the Eighteenth Brigade, containing the Nineteenth and Thirty-sixth Regiments; the Ninth Cavalry Regiment, and Ninth Artillery Regiment.

(d) Fifteenth Kobi Brigade.

(e) Second Cavalry Brigade (Tamura), Fifteenth and Sixteenth Regiments.

(f) Second Artillery Brigade (Nagata), containing the Sixteenth, Seventeenth, and Eighteenth Regiments.

VI. General reserve:

(a) Third Division (Okubo), composed of the Fifth Brigade, containing the Sixth and Thirty-third Regiments; the Seventeenth Brigade, containing the Eighteenth and Thirty-fourth Regiments; the Third Cavalry Regiment, and Third Artillery Regiment.

(b) The First, Thirteenth, and Fourteenth Kobi Brigades.

Total, 24 or 30 battalions, 3 squadrons, 36 guns.

Each division has a pioneer battalion with the same numerical designation as the division.

The total number of machine guns attached to the various organizations is estimated at 200.

The number of unplaced organizations and of those that arrived during the battle, as well as the number of unorganized reserves at hand to replace losses in battle, are unknown.

The total effective strength is estimated at 325,000 ^a.

^a The total troops mobilized by Japan during the entire war consisted of the 13 old and 4 new divisions, 12 Kobi brigades, the 2 independent brigades of artillery, the 2 independent brigades of cavalry, and the organizations of heavy field and siege artillery taken from the 21 battalions of coast artillery raised to war strength.

The 4 new divisions, Thirteenth, Fourteenth, Fifteenth, and Sixteenth, were composed mainly of recruits, though containing men from the Kobi, Kokumin, and Hoju (conscript reserves).

The Japanese division has a combatant strength in round numbers of 14,000: ration strength, 20,000.

In round numbers this gives a total of.....	485, 000
to which must be added of the Hoju, on the lines of communication	200, 000
Sick removed to Japan.....	281, 587
Killed.....	43, 219
Disappeared.....	5, 081
Total.....	1, 014, 887

The Kobi troops usually formed brigades of 3 regiments of 2 battalions each, 1 battery and 1 squadron.

The Tomioka Detachment consisted of the Eighth Kobi Brigade and the following from the Fourth Division: Three battalions of infantry, 1 section of cavalry, 1 battalion of artillery, and the battery of Russian guns.

The greater part of the Third, Fourth, Fifth, Sixth, and Eighth Cavalry Regiments were attached to the First Cavalry Brigade, forming the Akiyama Detachment.

The main Russian position extended from Ssufangtai through Changtan, Lingshenpu, Shahopu, Fengchiatun, and Pienniulupu to Kaotuling. At Shahopu it crossed to the left bank of the Sha River, recrossing to the right bank at Tashan. There was also an advanced portion of the line south of the Sha, reaching from opposite Fengchiapu to Yanghsintun. Otherwise, from Linshengpu eastward the main position followed the high ground on the right bank of the Sha River.

From the vicinity of Laishengpu a line of prepared positions ran north through Erhtaitzu, Machiapu, Yangshihtun, Niuhsintun, and then northeast across the Hsinmintun highway in the neighborhood of Houtai.

In the rear of the main line was a line of connected works constituting bridgeheads, on the left bank of the Hun, covering the crossings from about 2 miles west of the railway bridge to the vicinity of Yankuantun. On the right bank of the Hun a prepared line extended from Fuling to Fushun.

From the Hun River eastward to Pienniulupu the main Japanese position ran parallel to and practically in contact with the Russian line; both lines passing through the same village of Linshengpu. The left flank was strengthened by preparing for defense the villages, on the right bank of the Hun, extending southward to west of Hsiaopeiho.

About 2 miles east of Pienniulupu the line turned back and ran in an irregular curve to the Pensihu region.

Like the Russians the Japanese had prepared successive positions in rear of the main line.

Just prior to the battle the positions in the Russian army of the various organizations were as follows:

In the Second Army General Rennenkampf's cavalry was to the west of Ssufangtai, Kossagovski's brigade at Ssufangtai, the rifle corps from near Ssufangtai to astride the Hun at Changtan, the Eighth Corps opposite Chentanpu, Tenth

Corps north of Litajentun, and the First Siberian Corps in reserve on the right bank of the Hun, opposite Tawangkampu.

In the Third Army the Fifth Siberian Corps, less one brigade, was near Talientun, the Seventeenth Corps on the railway, and the Fifty-fifth Division, Sixth Siberian Corps, at Shahopu.

In the First Army, the First Corps was at Putilov Hill, the Fourth Siberian Corps was at Erhtaokou, the Second Siberian Corps held the line from Fengchiapu to Kangtolishan, and the Third Siberian Corps held the remainder of the line to Kaotuling.

In the Eastern Detachment, General Eck, with 10½ battalions, 11 sotnias, and 24 guns, was in the neighborhood of Chinghochon; General Liubavin, with 2½ battalions, 4 sotnias, and 6 guns, was near Kaolingtzu; General Maslov, with 4 battalions, 1 sotnia, and 2 guns, was at Hsingking.

General Baumgarten, with 1 battalion, 18 squadrons, 30 guns, and 8 machine guns, connected the Chinghochon Detachment with the left of the Third Siberian Corps.

In the general reserve the Sixteenth Corps was at Peitapu, the Seventy-second Division near Hsiaoquentun, the One hundred and forty-sixth Regiment at Huanshan.

In the Japanese army the positions were as follows:

The Fifth Army was in the Saimachi-Hsienchang region.

In the First Army the Twelfth Division was at Shangpingtaitzu, the Guards opposite Yanghsintun, the Second Division near Tsaichiatun in reserve.

In the Fourth Army the Tenth Division was opposite Tashan, the Sixth Division was on the Mandarin road, its left extending to southwest of Linshengpu.

In the Second Army the Tomioka Detachment held the line from southwest of Linshengpu to Hsiaotai, the Fourth Division from Hsiaotai to Chentanpu, the Fifth Division from Chentanpu to Malengtzu, the Eighth Division from Malengtzu through Erhchiahotzu to Huanlotaitzu, the Akiyama Detachment at Sanchiatzu, Mamikai, and farther south on the right bank of the Hun.

The Third Army had finished its concentration south of the Taitzu on February 19, and the Ninth Division was at Tashaling, the Seventh Division at Huangniwa, the First Division near Hsiaopeiho, the Second Cavalry Brigade on line with

the left of the Akiyama Detachment, the Second Artillery Brigade and the infantry reserve were near the Seventh Division.

On February 19 the Japanese Fifth Army moved forward in two columns. On the 22d, after skirmishing with small Russian detachments, it occupied the villages on the left bank of the Taitzu River in preparation for an attack on the Russian positions at Chinghochén.

On February 21 the Second Japanese Division marched to Weimingyíng and sent advance troops to the line Sanchiatzu-Kaochiaputzu, the Russian outposts being on the line Shinkailing-Peihunling-Houchiahotzu. On the 24th the Third Brigade moved to Kaokuanchai, the opposing Cossacks, under Baumgarten, withdrawing before the advance.

It was reported that false information had been conveyed to Russian headquarters that the Japanese reserves in the Yentai region had moved east.

On February 23 the left column of the Fifth Army attacked the Russian positions near Chinghochén, but was repulsed. The attack was renewed on the 24th and, in conjunction with the occupation of Chingtoukou by the right column, caused the positions to be evacuated toward evening. The Russian troops retired along the roads leading toward Fushun.

On the 24th, after consultation with General Kuropatkin, General Kaulbars recalled the order for his army to attack the next day. General Kuropatkin decided to reenforce his left, and to that end ordered that the First Siberian Corps proceed by forced march to Changsamutun, the attached brigade of the Sixth East Siberian Rifle Division by rail to Fushun, the Second Brigade of the Seventy-second Division to Shihuichen, the One hundred and forty-sixth Regiment to Yingpan. General Rennenkampf was sent to take command of the Chinghochén detachment and all other troops arriving in that region.

General Grekov succeeded Rennenkampf in command of the cavalry on the Russian right. General Grekov's cavalry was divided into two wings. The right (Pavlov) contained 15 sotnias and 12 guns of horse artillery; the left (Eichholz) contained 17 sotnias and 6 guns of horse artillery.

Kossagovski's brigade was withdrawn from the West Detachment to the general reserve of the Second Army, and later joined on the Rifle Corps at Ssufangtai.

On February 25 the Japanese Fifth Army engaged the advance guards of the Chinghochien Detachment, and advanced, the right column to Hsiehuanling, the left to Taling.

In the Japanese First Army the Second Division concentrated on the Third Brigade at Kaokuanchai, and, its left connecting with the right of the Twelfth Division and its right being at Yangtianshan, began developing the ground toward Kaotuling. The Twelfth Brigade moved to the Sha River north of Tahopu, and the Fifth Kobi Brigade, Twelfth Division, to Tabekou. A battalion of the Guards made an unsuccessful night attack on Yanghsintun.

On February 26 the columns of the Japanese Fifth Army reached Yulingkou and Shanlunkou, respectively, after slight skirmishing with the Russian rear guards.

In the Japanese First Army the Second Division moved against the line Kaotuling-Hsikouling-Petalinkouling. The Fifteenth Brigade attacked the positions at Hsikouling and Petalinkouling, which were held by a force of about three battalions and a portion of the Siberian Cossack Division, but did not make much progress. The Third Brigade advanced and sent a detachment to occupy Wanfuling. The Fifth Kobi Brigade, Twelfth Division, occupied the heights south of Sungshutsuitzu. There was an exchange of artillery fire between the Guards and the opposing Russians south of Fengchiapu.

At night the Russians made small attacks, west of the railway, near Wangchuanztzu, Paotzuyen, Yapatai, and Hsiaoshutzü.

On February 27 the two columns of the Japanese Fifth Army were checked at strongly occupied positions near Tita and Wupainiulu, the troops in the first being under Danilov, in the second under Rennenkampf in person.

In the Japanese First Army the Fifteenth Brigade, threatened by the Two hundred and eighty-fourth Regiment, Seventy-first Division, in the hills east of Petalinkouling and the arrival of a regiment of infantry at Shopu, suspended its intended attack on Kaotuling from the east and took up a defensive position, in which it continued without serious engagement until March 5. The right of the line from Petalinkouling was bent back facing the east. The Third

Brigade attacked and carried a Russian redoubt east of Wanfuling. The Twelfth Division engaged in artillery fire, while the Guards continued the exchange of artillery fire.

The Fourth Army began to fire against Putilov Hill and Novgorod Hill (just east of Putilov Hill).

In order to divert attention from the movements of the Japanese Third Army, the artillery of the Second, excepting the heavy guns, fired slowly from 8 to 9 a. m. and from noon to 1 p. m. The Fifth Division sent one regiment to Kuchentzu, the Eighth Division sent one to Hsiaotientzu to join the reserve of the Second Army, whose headquarters were now at Koutzuyen.

On this day the Japanese Third Army began its general turning movement. The Ninth Division moved to the line Mamikai-Houfangtaitzu (west of Mamikai), the Seventh Division to Lokonto-Sojushi, the First Division to Mashanchiatzu-Kalima, the artillery brigade and infantry reserve to Wuchiakangtzu, the Second Cavalry Brigade to Kualingteh, on the right bank of the Liao River. The Russian cavalry observed but did not resist this advance.

The First Siberian Corps arrived south of Shihuicheng.

On the night of the 27th a force from the Seventeenth Corps attacked and carried the railway bridge over the Sha River. It was, however, recaptured by the Japanese on the next day.

On February 28 the two columns of the Japanese Fifth Army began a series of determined and costly attacks against the positions of Tita and Wupainiulu. The right column made no progress. The left column carried the heights northeast of Tiupingtai and those northwest of Wupainiulu, and at night made an attack on the main position on the height south of Machuntun, where it was repulsed.

In front of the Japanese First and Fourth Armies there was but little change from the conditions of the preceding day.

In the Japanese Second Army General Akiyama advanced from Sanchiatzu (6 miles east of Mamikai), driving back the opposing cavalry and infantry outposts, and occupied the two villages (Chien and Hou) of Mahulingtzu with the First Cavalry Brigade, and Huanlotaitzu, Toutaitzu, and Hsiaohenwai with the attached troops. The artillery of the Eighth Division assisted this movement by bombarding Toutaitzu and Mahulingtzu.

In the Japanese Third Army the Ninth Division, which was to have occupied the line Ssufangtai-Changchiwopeng, halted at Tsuyutai because of the vigorous defense of Ssufangtai. The Seventh Division advanced to Tahoangchipu, the First Division to Chentzukou, the Second Cavalry Brigade to Yanglangchiapu, the artillery brigade and infantry reserve to Tatzuying.

General Kuropatkin sent the Twenty-fifth Division, Sixteenth Corps, toward Shalingpu and ordered Birger's brigade to march toward Hsinmintun so as to arrive at Kuliuhochen the next day.

On March 1 the Fifth Army made but little progress in the attacks on the positions at Tita and south of Machuntun.

In the Japanese First Army the Third Brigade, after hard fighting, carried two more redoubts on the heights north of Wanfuling. The Twelfth Brigade attacked the height northeast of Tungkou and was repulsed.

The Guards made a slight advance in two parts of their line near to and below Pienniulupu, and, in the early morning completed a night attack by which they captured a Russian trench on the heights north of Minchiayu, repulsing the Russian counter attacks.

The Fourth Army continued its artillery fire, to which the Russians energetically replied.

In the Japanese Second Army the artillery of the Fifth Division opened fire against Lichiaiwopeng and Changtanho-nan at 7.30 a. m., and the division advanced an hour later. The artillery of the Fourth Division, from near Yapatai, opened fire on Peitaitzu, Huanchi, and Hsinshantun, while Hayashi's brigade, Fourth Division, advancing past the west side of Chentanpu attacked a redoubt about 300 yards west of Peitaitzu. The Eighth Division crossed its main force to the right bank of the Hun and deployed against the Changtan-Nienyupao line, the artillery coming into action from near Toutaitzu. General Akiyama arrived at Toutaitzu with the main portion of his command and opened artillery fire against Nienyupao at 9 a. m. The attack was carried on during the day and into the night, but the Japanese failed to carry any portion of the Russian line.

In the Japanese Third Army the Ninth Division, which was to attack Ssufangtai as soon as the Seventh and First Divi-

sions had reached Suchiaan, opened fire from the southeast at noon. The artillery brigade advanced to Suchiaan, fired on and drove back the opposing cavalry. A part of the brigade then took position at Tapinghuang and opened fire on Ssufangtai. In spite of the cross fire thus obtained the Russians held Ssufangtai until night and then retired to the northeast. The Ninth Division made a night attack but found the village deserted.

By night the Seventh Division had reached Huoshihkangtzu, the First Division Hichiwotzu (5 miles northwest of Huoshihkangtzu), the cavalry brigade Tamingtun, the artillery brigade and infantry reserve Yuchiatai (3 miles northwest of Suchiaan).

On the evening of this day the First Cavalry Brigade was detached from the Second Army and sent to join the Third Army, thus giving the latter a full division of cavalry. General Kuropatkin sent General Shatilov with a composite division, drawn from the Tenth Corps, to reenforce the Twenty-fifth Division, Sixteenth Corps, near Shalingpu. The First Siberian Corps, now with the First Army, was ordered to proceed to Peitapu, and then to near Mukden as part of the general reserve.

To replace the Sixteenth Corps (Birger's brigade and the Twenty-fifth Division) in the general reserve the Eighth Corps was ordered withdrawn, the positions vacated by its withdrawal to be occupied by troops of the Rifle Corps. The withdrawal from Ssufangtai and vicinity of Kossagovski's brigade and portions of the rifle corps on the night of March 1, disarranged this plan and greatly increased the difficulties of the Eighth Corps on the next day.

On March 2 there was no material change in the conditions in front of the Fifth Army.

The First Siberian Corps reached Shahotzu in its return to the west. One-half of the Seventy-second Division remained in the front line north of Kaotuling, the other half was placed in reserve at Shihuichen.

In the Japanese First Army the Third Brigade captured 2 redoubts east of the Impan-Kaotuling road, but was repulsed with heavy loss in an assault on the third redoubt. The Twelfth Division continued the attack on the heights northeast of Tungkou and north of Chinghichai, captured the

first position and failed in the attack on the second. The Guards began operations against the Russian position south of the Sha River in the vicinity of Fengchiapu.

The Japanese Fourth Army began a series of small attacks to prevent the opposing forces being withdrawn to reenforce other portions of the line. The most important of these attacks was against Putilov Hill, from the vicinity of which the Russians made an unsuccessful night attack.

In the Japanese Second Army, Hayashi's brigade stormed the redoubt west of Peitaitzu, was driven out, made a second assault, which was repulsed, and finally carried the redoubt at 4.30 a. m., after very severe fighting.

The Fifth Division, which had suffered severely on the preceding day, observed the beginning of the Russian withdrawal, attacked the rear guards at Changtanhonan and Lichiauwopeng, securing possession at 5.30 and 7.30 a. m., respectively, and followed the Russians as far as Chiutsai-hotzu.

The main body of the Eighth Division, finding Changtan and Nienyupao deserted, advanced through the towns and followed up the bank of the Hun. The remainder of the division crossed the Hun and joined the main body. The Fifth, the Eighth, and the Kobi regiments of cavalry, from the Akiyama Detachment, were attached to the Eighth Division, which advanced to Hochuangtzu and by sunset occupied Wanchutai and Hsiaoliputzu.

The troops of the Fourth Division that were in reserve near Yapatai, observing the evacuation of Huanchi, attacked and carried Hsinshantun at 2.30 p. m.; Hayashi's brigade, after having captured the redoubt west of Peitaitzu, attacked Kuchiatzu, which was carried about 6 p. m. The Thirteenth Regiment of Artillery assisted by bombarding from a position taken up west of Peitaitzu. From the same position it assisted a regiment and battery of the Fifth Division in carrying Shoukuanpu at 5 p. m. After taking Kuchiatzu Hayashi's brigade carried Erhtaitzu at 7 p. m. The troops of the Fourth Division that were occupying the line near Litajentun advanced against and carried Fuchiachuang at midnight.

In the Japanese Third Army the Ninth Division advanced to Hsiaotaitzu. A mixed division, containing the Two hundred and fifteenth, Two hundred and forty-first, Fifty-fourth,

and Sixtieth Regiments, that had been formed for the purpose of an advance via Shalingpu, was placed under command of Major-General Golembatovski, a brigade commander in the Fifteenth Division, moved southeast from Shuangshutun and drove the Japanese back from Peihosa and Sathaisa, thus greatly aiding the Russian Eighth Corps in its retreat from territory in which it was being attacked on three sides, and allowing it to reach the designated line, Tontaitzu-Hsintaitzu.

The Japanese Seventh and First Divisions reached their destinations, the vicinity of Shalingpu and Lamuhö, respectively, about noon without having met resistance. From these positions the Seventh Division was ordered to the line Tachuingsuitzu-Tatzupu, the First Division to the line Changchiafang-Hsiniulu. The Second Cavalry Brigade reached Chinchiatai, the artillery brigade and infantry reserve reached Shalingpu by 6 p. m., the First Cavalry Brigade arrived and was posted at Panchiatai to close the gap between the Ninth and Seventh Divisions.

Lieutenant-General Topornin, with the Twenty-fifth Russian Division (Lieutenant-General Pnevski) and a mixed division from the Tenth Corps (Major-General Shatilov), attacked Shalingpu about 5 p. m. The cross fire from the Seventh and First Divisions repulsed the attack. The Russians, though losing heavily, continued to hold the villages in their vicinity, repulsing the attacks of the Japanese.

On account of the progress of the Japanese following the Rifle Corps and Kossagovski's brigade on the right bank of the Hun, a slight change was made in the Russian plan of withdrawal of the Second Army, which was ordered to occupy the line Tusampu, Changsupu, Sualpu, with reserve at Suhupu and advance troops at Tawankampu. The Tenth Corps was to march on Sualpu. In the Eighth Corps the Fifteenth Division was to act as rear guard of the Second Army and withdraw along the left bank of the Hun. The mixed division under General Golembatovski was to act as rear guard on the right bank of the Hun, keeping abreast of the Fifteenth Division. A mixed division of three regiments from the Seventeenth Corps was sent under command of Major-General De Witt to strengthen the Russian force acting against Shalingpu. A detachment of 8 $\frac{3}{4}$ battalions and 24 guns from the Rifle Corps was sent, under Major-General

Churin, during the night of March 2 to reenforce the troops in this same region, where General Kaulbars took command in person about 9 a. m. on the 3d, leaving General Launitz in command in the Suhupu region.

On March 3 the Japanese Fifth Army was still held in check by the Russians.

In the First Army the Twelfth Division continued its attack, but was unable to make any material progress. The Second Guards Brigade crossed the Sha River on the night of the 2d-3d and seized the heights north of Housung-muputzu and Tangehiatun. It then attacked the main position unsuccessfully, but maintained its own position on the right bank of the Sha River and repulsed the Russian attacks that were made on the night of the 3d.

The Russians made an attack from in front of Fengchiapu, but were repulsed.

There was no change in the conditions in front of the Fourth Army.

In the Japanese Second Army a force from the Tomioka Detachment made an unsuccessful attack on Tamuchinyen. The right of the Fourth Division, strengthened by the Thirty-fourth Infantry from the Third Division, advanced to Peilintai; the left of the Fourth Division moved forward from East Hsiaohantai. By night the division formed a line from Sanchiatzu, through Hsiaokao, to Hoanchi. The Fifth Division advanced from Shoukuanpu to a line from west of Inerhpu to Suliandampu, skirmishing with the Russian rear guard at Tontaitzu. The Eighth Division marched up both banks of the Hun, from Wanchutai and Hsiaoliputzu, the right column recrossing the river below Litapu to Waichiapu.

In the Third Army there was no change of position by the Seventh and First Divisions. The Ninth Division, relieved by the Eighth Division, Second Army, moved to Linchiatai.

General Topornin, with his force of 32 battalions, again attacked Shalingpu. The Japanese First Artillery Brigade and infantry reserve had now deployed near this village, adding their fire to that of the Seventh and First Divisions. The Russians lost heavily, particularly in the right column, Twenty-fifth Division, under Lieutenant-General Pnevski. General Kaulbars arrived about 9 a. m. and directed the

withdrawal of the attacking force. The troops of the Twenty-fifth Division were halted near Yukuantun, those of the Tenth Corps, near Huankutien. De Witt's detachment, 11½ battalions, was occupying the line Makuantzu-Houtai.

On the extreme left the Japanese Second Cavalry Brigade came into contact near Tafangshen with Birger's brigade, retiring from the Hsinmintun region, supported by about 25 squadrons of Russian cavalry. Two battalions were sent from the First Division to reenforce the Second Cavalry Brigade which, concluding that it was confronted by an offensive operation, took up a defensive position. In the evening the Russians withdrew, no severe fighting having occurred. Birger proceeded to Hushihtai station with his main body; a detachment separated from the main body and reached the Mukden station.

The first Siberian Corps arrived at Mukden station in the afternoon.

Because of the disaster at Shalingpu the Russian plan was still further modified. Twenty-four battalions of the Second Army were to be left astride the Hun River in the Machiapu position, with a rear guard at Suhupu. The remainder of the Second Army was to be concentrated, on the fortified line west of Mukden, in readiness to take the offensive against the Japanese Third Army. The right of the Third Army was to be withdrawn so as to run from Linshengpu through Laishengpu.

To carry out this plan, General Launitz ordered parts of the Tenth, Eighth, and Rifle Corps to march in two columns through Machiapu to Shatotzu, the trains crossing to the right bank of the Hun by way of the railway bridge. The Fifteenth Division, General Ivanov, on the left bank and Golembatovski's detachment on the right bank of the Hun, were to remain in position. General Tolmachev, commanding a portion of General Grekov's cavalry was to protect the right flank of this line.

The resulting movements were carried on during the night and were still in progress on the 4th.

General Golembatovski apparently found himself unable to hold his portion of the line on the 3d and withdrew prematurely. General Ivanov, because of this withdrawal,

decided it was not practicable to occupy Changsupu, but fell back at once to Tatai without occupying Suhupu. The latter village was occupied by a Japanese party about 11 p. m., and General Ivanov then extended his right to the Hun River at Erhtaitzu, in order to bar the further approach of the Japanese against the right flank of the Russian Third Army.

On March 4 the Japanese Fifth Army, finding itself unable to advance, desisted from attacking, though remaining in contact with its opponents. The left of the right column was vigorously attacked by the Russians who were reenforced by the arrival of the Eighty-fifth Regiment.

In the Japanese First Army the Fifteenth Brigade left the Thirty-ninth Kobi Regiment between Hsikouling and Peitainkouling and concentrated the remaining troops near Houchiayü. The Twelfth Brigade was drawn back to north of Tabekou and concentrated on the remainder of the Twelfth Division, which then attacked and carried the first Russian position north of Pienniulupu. The Japanese also carried a trench near Housungmuputzu, thus improving the situation of their troops in that vicinity.

There was no change in the conditions in front of the Fourth Army, to which the Tomioka Detachment and the Fourth Division were transferred at noon. The Fourth Division captured Hsiaosholuitzu and Laishengpu, repulsing three attempts to recapture the latter. At the time of the capture of Hsiaosholuitzu the left of the Tomioka Detachment moved forward and captured Tamuchinyen. The opposing Fifth Siberian Corps withdrew to the line Suchiatun-Peitaitzu-Pechentzu.

The right of the Fifth Division, after repulsing an attack, advanced and occupied Inerhpu. The remainder of the division assembled at Changsupu. The artillery of the division, from between Suhupu and Suliandampu, assisted the advance of the Eighth Division on the opposite bank of the Hun. Later, the Fifth Division, leaving one detachment at Suhupu and one at Changsupu, crossed the Hun and proceeded against Hsiaoshatotzu.

The Eighth Division occupied Hiatzu, Hsiaoyushupu, and Tayushupu, and the advance troops took up a position from Yulinpu to Nienkuantun in which they were subjected to

infantry and artillery fire from Yangshihtun, Hsiaoshatotzu, and Machiapu.

The first line of the Fifth Division then advanced against the portion of the line between the old railway bridge and Hsiaoshatotzu, being assisted by the fire of the Fifth Artillery Regiment from east of Tayushupu. The attack suffered severely and made no progress.

The Third Division, in the Japanese Manchurian army reserve, was added to the Second Army and by sunset had reached Tuinandou and Hsiao-chingsuitzu. The headquarters of the Second Army moved to Waichiapu, its general reserve to Suliandampu.

In the Japanese Third Army the Ninth Division was directed to march on Mukden station, the Seventh Division on the north Tombs, and the First Division on Chengitun. The Seventh Division reached Fentai and sent one regiment to attack Likuanpu, but this attack was not pressed. The First Division reached Tashihiehiao without opposition. The First Cavalry Brigade joined the Second, and the Cavalry Division, accompanied by 2 batteries and 6 machine guns, reached Chienshentaitzu.

On March 5 the Japanese Fifteenth Brigade, attacking from the direction of Menyaputzu, drove back the troops of the Two hundred and eighty-fourth Regiment and occupied a line through Tungkouling.

In the Japanese Fourth Army the Tenth Division occupied Liuchiangtun and advanced its line slightly in front of Shahopu. The Tomioka Detachment and the Fourth Division advanced to the lines west Hanchengtzu, Wenshinpu, Tatzuin, and Hsiao-suchiapu, Tasuchiapu, Pechentzu, respectively. This advance was facilitated by the shifting of positions in the Seventeenth Corps (weakened by the mixed division that had been drawn from it) by which the Third Division stood at right angles to the Fifth Siberian Corps, along the railway facing west while the Thirty-fifth Division still fronted south. The commander of the Seventeenth Corps, in order to close the gap that had resulted from bending back the Fifth Siberian Corps on the fourth directed, at 9 p. m. of that day, that his corps should swing back to the railway, facing west. About 11 p. m. he issued a second order to hold a position, facing south, to the rear of the old

line. During the night the Third Division had carried out the first, and the Thirty-fifth Division had carried out the second order.

The result of the day's fighting was that in the Russian Third Army the Fifth Siberian Corps occupied a line from Pechentzu to Suchiatun; the Seventeenth Corps, from Suchiatun along the railway to Hanchengtzu and thence to Kuantun; the Sixth Siberian Corps extended from Kuantun in the shape of a bastion front facing Shanlantzu; the reserve of about 10 battalions was near Shanhotun. At this time the Third Army contained about 64 battalions, 208 guns, and 18 mortars. Near Erhtaitzu was a detachment, Colonel Kuznetsov, belonging to the Second Army, but transferred on this day to the Third Army.

The formation of the Russian troops west of Mukden at this period, and the Russian plan are shown in the following order of General Kaulbars, commanding the Second Russian Army:

MUKDEN STATION,

1905, March 5—12.45 a. m.

Information has been received that in the neighborhood of the village of Sanpuho a Japanese column has appeared, consisting of cavalry and infantry. The object of the army is to drive the enemy westward to beyond the line of the old railway (as far as Machiapu, East Kuchiatzu, Hsiniulu), advancing so as to envelop the enemy's flank.

Continue scouting. Examine the entire region between the railway and the road to Hsinmintun.

Aim: To determine the direction of enemy's march and the number of his troops. Other cavalry to continue its work in the rear and on the flanks of the enemy.

To assemble at 8 a. m. on the line Hsiaochiatun-Houtai. To press the enemy's left flank, enveloping and driving it to the west.

For that purpose:

A. Cavalry.

Colonel Vovonov; Primorski Dragoon Regiment.

B. Infantry.

1. Right column: General Gerngross; 1st Siberian Corps; mixed division, 17th Corps; mixed division, 10th Corps; the 147th Samara Regiment (49 battalions, 115 guns).

2. Center column: General Topornin; 25th Infantry Division (16 battalions, 48 guns). To remain in position until the influence of the enveloping action of the right column becomes evident, and until the enemy withdraws behind the line Jahan-Yuchiutun; then advance west in the direction Chang-shihtun-Makuantzu.
3. Left column: General Tserpit-ski; five infantry regiments (56th, 121st, 122d, 215th, and 33d); 5th, 7th, 8th Rifle Regiments, 5th Rifle Brigade (34 battalions, 72 field, 17 old pattern guns, 12 mortars). To firmly hold positions occupied; to advance simultaneously with the 25th Division, pivoting on Machiapu. Aim: To occupy the line of the old railway from the General Dembovski's positions to the village of Kuchiatzu, inclusive; prepare the line for firm defense.
4. General reserve: General Hanefeld; 55th and 241st Regiments (8 battalions). To take position near the village of Lukuantun.
5. Region for assembling trains: Of the right and center columns, north of Mukden between the railway and the Mandarin road; of the left column, between the railway and Mukden north of the Hsinmintun road.
6. Hospitals and parks: As ordered by commanders of columns.
7. Substitutes in case of emergency: General Ruzski, General von der Launitz.
8. Reports to be sent to village Houtai (village with a tower) on the Hsinmintun road.

In the Japanese Second Army at 4 a. m. the Fifth Division resumed its attack toward Hsiao-shatotsu. Its advance was covered by the fire of the battalion of field and heavy guns, posted north of Tsuichiapu, and the Fifth Artillery Regiment, posted southeast of Tayushupu, and reached the old railway embankment. Here it came under the infantry fire of the Russians holding Machiapu and was repulsed. The right of the Eighth Division, attacking with three battalions from the direction of Yulinpu, joined on the left of the Fifth Division. The main force of the Eighth Division attacked Yangshihtun. Both attacks failed, as did a third attack made about 2 p. m. The Third Division moved from Tachingtsuitzu to relieve the Ninth Division and during the night occupied Changshihtun and Suimintun.

The Ninth Division then withdrew to take up a position between the Seventh and First Divisions. Otherwise there was no important movement in the Japanese Third Army.

During the afternoon the First Siberian Corps, less 8 bat-

talions of the Ninth Division which had been sent to Shatotzu to aid the troops holding the line at and near Machiapu, had advanced with but little opposition to the line Taochiaotun, Tachiatzu-Tafanhsintun.

On March 6 the Japanese Fifteenth Brigade made a slight advance beyond Tungkouling. Otherwise conditions in front of the Japanese First Army did not change materially. The Russians made an unsuccessful night attack on the Japanese near Tangchiatun.

The Fourth Army continued its operations west of the Mandarin road, attacking Shahopu, east Hanchenztsu, Suchiatun, Peitaitzu and Erhtaitzu.

The offensive movement begun by the Russian Second Army on the preceding day was to be continued according to the following order issued by General Kaulbars shortly before midnight of the 5th-6th:

The enemy is concentrating his forces (three divisions) in the angle between the Hun and the old railway line. Farther to the north toward the Hsinmintun road have been seen infantry and artillery, numbers not ascertained. Northeast of the Hsinmintun road small detachments of cavalry are in front of our positions.

To-morrow the army will continue the movement to occupy the line Shalingpu-Tehsiangyintzu-Lianchiapu, including the sand hills between Linminhuantzu and Tehsiangyintzu, observing also the action of the enemy to the north and northwest.

To that end: 1. *Colonel Zapolski's detachment* is to march from Santaitsu at daybreak, go to Tashihchiaio, and bar the Hsinmintun road.

2. *General Gerngross's detachment*: (a) *The mixed division of the Seventeenth Corps* (De Witt, from near Tafanhsintun), two regiments to go to Tashihchiaio and remain until the arrival of Colonel Zapolski's detachment, then to move on Jahen, Yangchiahung, Chienchiahung, Lanshantai; three regiments to go to Hohuntai, Yuchiatun, Hounmintun, Chienmintun, Koulintai. (b) *The First Siberian Corps*, to march at daybreak: Nine battalions from Chinsotun to move on Likuanpu, Changshihtun; nine battalions from Sanchiafin to move on Yukuantun, Nienkuantun; the sand hills to be fortified when taken.

3. *General Tserpitski's detachment* to hold fast the position (between Machiapu and Yangshihtun) occupied and support by fire the detachment of General Gerngross; simultaneously with attack of latter detachment on Changshihtun, Nienkuantun, occupy Yulinpu and later the old railway line.

4. *General Herschmann's detachment* to hold fast the position (on both banks of Hun at Machiapu) occupied.

5. *General Topornin, general reserve* (Twenty-fifth Infantry Division and Second Brigade of the Thirty-first Infantry Division), to remain in positions (from Yangshihtun to Nihsintun) occupied and aid by fire the advance of the First Siberian Corps.

6. During the advance all four columns to aid each other with fire and bayonet, striving to take the enemy in flank.

7. *General Birger's detachment* to remain near Hushihitai station and protect Mukden from the north.

8. Trains of second and third categories to take position east of the railway.

9. Reserve of flying artillery parks to take position at Lanyutun.

10. Reports to be sent to Houtai.

11. In case of emergency, next in command General Ruzski and General von der Launitz.

The advance of General Tserpitski's portion of the line (from Machiapu to Yangshihtun) was anticipated by the renewal and intensification of the attack by the Japanese Fifth and Eighth Divisions on Machiapu, Hsiaoshatotzu, and Yangshihtun. As on the preceding day, the Russian infantry in Machiapu was able to bring flank and even reverse fire on that portion of the Japanese line that succeeded in reaching the old railway embankment. The greater part of the fire of the Japanese battalion of field and heavy guns north of Tsuichiapu and of the Fifth Artillery Regiment of mountain guns, southeast of Tayushupu, was concentrated on Machiapu and Hsiaoshatotzu, and the infantry of the Fifth Division made a determined but unsuccessful assault. Toward evening the Twenty-first Brigade, Fifth Division, now on the left bank of the Hun, was detached and ordered to join the Third Division.

The Eighth Division attacked as on the preceding day. Its heavy guns took position north of Hsiaoyushupu, its field guns crossed the railway embankment and opened fire against Yangshihtun. The right of the division, at Yulinpu, made an unsuccessful assault, losing heavily. It was assisted by the Thirteenth Artillery Regiment, which had rejoined the Eighth from the Fourth Division and had taken position east of Tsaochiatun. The left of the Eighth Division also made an unsuccessful assault.

The Third Division sent two battalions to a line about 800 yards east of Changshihtun, the divisional artillery to northeast of Changshihtun and the Twenty-first Brigade to Likuanpu. Its attack was not pressed.

The Second Army headquarters were at Hsifanpu, the general reserve of two battalions at Tsaochiatun, where it was joined by one battalion of the Thirty-fourth Regiment, Third Division, returning from duty with the Fourth Division.

General Gerngross moved against Tashihchiao as ordered. The time was opportune, for there was a gap on the left of the Japanese Seventh Division at Tashihchiao, caused by the march north to Pinglupu-Koushihyang of the First Division, which had not been closed by the expected arrival of the Ninth Division. By 11 a. m. the advance of this attack had penetrated nearly to Tashihchiao. The right flank guard of the advance, Colonel Lesh, carried Chuanwanchiao about 10 a. m., the Japanese detachment retreating to Liutsiahuan. This village was then unsuccessfully attacked by Colonel Lesh assisted by other troops from General De Witt's column. The Japanese Third Army reserves, from Mashanchiatzu, and a battalion from the left of the Seventh Division succeeded in holding the attack in check until the Ninth Division began to arrive. About 3 p. m. the attack was repulsed after losing heavily, and General Gerngross ordered a suspension of the forward movement, thus concluding the last important offensive movement undertaken by the Russian army, and presumably causing the decision to withdraw from the Sha to the Hun River.

The Japanese Cavalry Division was checked by the opposing cavalry in the vicinity of Erhtaitzu.

The Second Brigade of the Thirty-first Division, Tenth Corps, in the reserve of General Kaulbar's army was brought, toward evening, from the left bank of the Hun to Lukuantun in response to reports sent by General Tserpitski regarding the severe attacks made on his line between Machiapu and Yangshihtun.

A detachment of 4 battalions, 8 guns, and 1 scout company, under Colonel Tsikovich, was sent by General Kuropatkin from his reserves to reconnoiter northwest through Santaitzu. The Tenth Rifle Regiment, which had arrived by rail, was added, and the detachment, under command of Colonel Missevich, of the Tenth Regiment, was first ordered to hold the line Tachiatus-Santaitzu-Yuanchentun and then sent about 4 p. m. to Makuantzu for the defense of the Niuhsintun-Makuantzu district.

On March 7 the left of the Japanese Fifth Army made a slight advance, establishing communication on the heights north of Tuchiaputzu with the Fifteenth Brigade, which had been brought to a halt after a slight advance.

The Russians made an attack against the heights north of Tangchiatun and one against the Tenth Division, both of which were unsuccessful.

East Hanchengtzu was carried, about 11 a. m., by the Sixth Division and the Tomioka Detachment after an engagement that had continued from the evening of the preceding day. In carrying out this attack the Sixth Division concentrated on its left, and the resulting gap on its right was closed by inserting the Third Reserve Brigade opposite Shahopu.

The attempt to carry the attack on east Hanchengtzu to Kaolitun was repulsed. The Fourth Division attacked Hsiaokushinpu, but did not make any headway until the next day.

In the Japanese Second Army the Fifth Division remained stationary. The Eighth Division made a night attack, the right advancing from southeast of Yulinpu, the left advancing from north of Nienkuantun against Yangshihtun. The attack failed and the troops taking part retired to their original positions. The Third Division made an attack before dawn, in which the Fifth Brigade, General Nambo, carried Yukuantun, held by troops of the Twenty-fifth Division. Desperate fighting for the possession of this village continued throughout the day, and at night the remnants of the Fifth Brigade, about 1,000 men, many of whom were wounded, withdrew to their old line. The desperate fighting caused reinforcements aggregating 4 battalions and 2 heavy batteries to be sent to the Japanese Third Division and 16 battalions to the opposing Russians. In Japanese accounts the scene of this fighting is frequently placed at Likuanpu. The Russian losses in recapturing the village were 141 officers and 5,343 men killed and wounded.

The Japanese Third Army was now charged with breaking through the defense between Chengitun and the north Tombs. Two and one-half brigades of reserves from the Manchurian army headquarters were added and assigned to the different divisions according to emergency. The Seventh Division was to march on the north Tombs, the Ninth Division on Yunsontun, and the First Division on Chengitun.

The Seventh Division carried Chuanwanchiao, held by Colonel Lesh, and attacked Tafanhsintun, carrying the latter village at nightfall. The Ninth Division, assisted

by the Second Artillery Brigade, after an engagement lasting all day, carried Chaohuatun, held by Colonel Zapolski with the Ninth Rifle Regiment and the newly arrived One hundred and forty-seventh Infantry Regiment, with heavy losses on both sides. The detachments of Colonels Lesh and Zapolski were both reenforced by troops from the First Siberian Corps. Colonel Zapolski's detachment halted at Tachiatzu. The Japanese First Division reached the line Siutaitzu-Chengigitun, from which its artillery damaged the railway slightly.

The Japanese Cavalry Division was on the line Tashintun-Lichiaputzu after failing in an effort to cut the railway at Hushihtai.

At 1 p. m. on the 7th General Kuropatkin issued an order for withdrawal in which it was directed that:

1. The *Third Army* to occupy the fortifications of the tête de pont from the Hun to redoubt No. 5 east of Muchiapu, inclusive, detailing 16 battalions to the strategic reserve at Mukden.

2. The *First Army* to occupy the Fuling and Fushun positions, its right on redoubt No. 5. The detachments of Generals Danilov and Maslov to cover the roads leading from the line Fushun-Yingpan to Tiehling. The First Army to detail 24 battalions to the strategic reserve at Mukden.

3. The *Second Army* and corps temporarily attached to same to cover this movement, holding back the enemy on the line of the villages Yuanchentun-Chaohuatun-Yukuantun-Yangshihtun-Shatotzu, holding enemy back on the right of this line to the utmost limit.

* * * * *

5. The troops of the *Third* and *First Armies* to withdraw their main forces during the night of the 7th-8th quite secretly leaving on their positions strong rear guards which are to retreat only when pressed by the enemy, holding him back as long as possible.

Early on the 8th Colonel Borisov was sent to Tsuerhtun with the 5½ battalions and 8 guns belonging to the Fourth Siberian Corps and held in reserve by General Kuropatkin, thus forming a nucleus for the detachment formed and placed under command of General Milov. General Herschellmann and his 16 battalions were taken from General Kaulbars, ordered to remain in reserve at the disposition of General Kuropatkin, and then ordered to Tsuerhtun to report to General Milov. To this detachment under General Milov were to be added the 40 battalions and 14 batteries detached from the First Army and the 16 battalions detached from the Third Army. It was to clear and hold the ground north

and west from Tsuerhtun so as to protect the railway and be ready for an energetic offensive that was to be executed on March 9.

General Milov was available for the command of this detachment because of his own corps, the Eighth, having since March 3 been distributed among the various detachments that had been formed.

By morning of March 8 the withdrawal of the Russian First Army was well under way. The withdrawal was announced by the flames from burning supplies, and the opposing Japanese took up the pursuit. The prepared roads leading from the positions back to the Hun facilitated the withdrawal, which was accomplished with but few rear-guard actions and slight losses in personnel. By daylight the Russian Second Army, which lost heavily in matériel, had occupied its new positions with the 46 battalions remaining after detaching the 16 battalions to the strategic reserve.

The Japanese Fourth Army, except the Tomioka Detachment and the Fourth Division, which were transferred back to the Second Army, moved forward in pursuit. The detachment was ordered to hold the line from Suchiatun to Erhtaitzu, the Fourth Division to cross to the right bank of the Hun. The troops, however, were more or less disorganized by the fighting of the preceding day and but one battalion, of the Thirty-seventh Infantry, had joined the Second Army reserve at sunset.

The Russians had withdrawn all but a small rear guard from Machiapu during the night of the 7th. On the morning of March 8 the right of the Japanese Fifth Division, on the left bank of the Hun, advanced through Erhtaitzu and, by evening, occupied Machiapu. The left of the Fifth Division, which had drawn back behind the old railway embankment during the night, advanced to west of Hsiaoshatotzu, which was still held in force. This advance was assisted by the mountain guns of the division from a position near the railway embankment.

The Japanese Third Division failed to make any progress, its action consisting principally of artillery fire.

In the Japanese Third Army the Ninth Division had a village at the junction of the railway and the Santaitzu road

as objective, the Seventh Division had Kinchiauatzu, the First Division had Yunsontun.

One brigade of the Seventh Division attacked Hsiaofanhsintun and was repulsed with heavy loss. The other brigade and the attached reserves made several unsuccessful attacks on Hsiaochiatun. The Ninth Division captured Tachiatzu, about 1 p. m., after severe fighting in which the Russian commander, Colonel Zapolski, was killed. The First Division attacked the Yuanchentun-Santaitzu line but, after hard fighting, was brought to a stand about 600 yards from the opposing line.

The opposing cavalry divisions engaged each other, both mounted and dismounted, in the vicinity of Houshintun.

On March 9 the movements of both armies were influenced by a violent gale and accompanying dust storm.

On the south front the general line of separation was the Hun River, with the exception of a small area in front of the Guards at Kiusan and of the bridge heads, covering the crossings south of Mukden, still held by troops from the Russian Third Army.

From Fushun northeast toward Yingpan were the detachments of Rennenkampf, Danilov and Maslov; from Fushun west to Tayingtin were troops of the Third and Second Siberian Corps; from Kiusan west through Fuling to redoubt No. 5, at Muchiapu, were troops of the Fourth Siberian and First Army Corps; a total of 106 battalions after detaching 40 battalions to the strategic reserve.

The right column of the Japanese Fifth Army pursued in the direction of Yingpan. The advance guard of the left column reached Fushun but withdrew because of the strength with which the prepared positions north of the Fushun-Kapukai line were occupied.

In the Japanese First Army the right column of the Twelfth Division (Twenty-third Brigade) was on the left bank of the Hun, opposite Holungtien. The left column (Twelfth Brigade) occupied the heights northeast of Tayingtin and west of Hsiaotai with one regiment, having penetrated the gap in the line between Kiusan and Tayingtin. The Guards reached the vicinity of Huanchiakou, sending the cavalry regiment and one battalion to Hushinpu. The Guards Reserve Brigade was at Tayingtin. The Second

Division arrived at the Hun and occupied the bridges at Fushun and Kapukai.

In the Japanese Fourth Army the reserve reached Yankuantun, the Tenth Division reached Wandaintun. The Sixth Division, leaving a detachment at Wanshitun, moved to in front of the bridge heads in the vicinity of Changhutun.

In the Japanese Second Army the Tomioka Detachment extended to the left so as to cover the ground held by the Fourth Division, which concentrated at Machiapu and sent one brigade across the Hun to attack toward Tapu, aiding the Fifth Division. The latter had, by a night attack, approached close to Shatotzu, where it was checked and suffering severely from a cross fire. The attack of the Fourth Division and the fire of its artillery from near Takushinpu relieved the situation.

The Eighth Division, leaving 5 battalions at Nienkuantun and Yulinpu, withdrew behind the old railway embankment and marched to Fentai, via Lanshantai and Jahen, to take the place of the Seventh Division. The Third Division extended its left by dispatching 2 battalions of infantry and 1 of artillery to near Fentai. The action of the Third Division was confined mainly to artillery fire.

In the Japanese Third Army the Ninth Division was withdrawn and sent to the left of the First Division. The Seventh Division moved to its left, occupied the ground vacated by the Ninth Division, and attacked the line Santaitzu-Tachiattun but was repulsed. The First Division, having been repulsed in a night attack on the line Santaitzu-Yuanchentun, was attacked from the north by General Herschelmann and Colonel Borisov and the left forced back to Chengitun, with the exception of a small party of Japanese who reached Santaitzu and barricaded themselves in some fanzas on the northeast edge of the village, repulsing all efforts to dislodge them. The reserves of the Japanese First Division checked this counter attack about 1 p. m. and another detachment from the First Division again attacked Yuanchentun at 2 p. m. At 6 p. m. the Russians again advanced and drove the left of the First Division back to Chengitun, where it was enabled to make a stand by the arrival of a brigade from the general reserve.

The Ninth Division, from Taochiatun, attacked toward Hsiaochiaotzu with its main body and Hushihtai with a detachment. The main body reached Kuoshantun; the detachment reached Waishutzu.

The opposing cavalry divisions were still in the vicinity of Tashintun and Houshintun.

General Kuropatkin decided to retreat to Tiehling and ordered that during the night the armies retreat to a line through Hushihtai station, Puho, and farther east; the Third Army to withdraw from the bridgeheads, using the Mandarin road without entering Mukden; the Second Army to cover the retreat of the Third Army from the west and then to retreat along the railway in succession from its left flank; the First Army to cover the retreat of the Third Army with its right corps and to withdraw, covering the roads leading from the line Fuling-Fushun-Yingpan toward Tiehling.

At the time this order was issued General Kuropatkin had received no information regarding the piercing of the line at Kiusan, and intended to make a vigorous attack westward with the detachment of General Milov and thus further facilitate the withdrawal of the Third and Second Armies.

In the withdrawal the 14 battalions and 47 guns remaining with the Sixth Siberian Corps were to follow the road, running practically parallel to the Mandarin road, from Muchiapu to Lienhuachi; the Fifth Siberian and Seventeenth Corps, 31 battalions and 120 guns, were to follow the Mandarin road, the first passing west, the second east of Mukden, after passing which the Seventeenth Corps was to form the rear guard of the Third Army. In the Second Army General Tserpitski with his 45 battalions and 164 guns was to move from Lanyutun to east of the railway and then through Yuanchentun, Tsuerhtun, and Kuchentzu, keeping abreast the Third Army; the Twentieth-fifth Division and First Siberian Corps, 52½ battalions and 144 guns, were to move through Wasia along the west side of the railway without crossing the same, the Twenty-fifth Division leading and the First Siberian Corps following successively from its left flank. The rear guards of the three columns of the Second Army were to maintain connection. General Launitz, reenforced

to 46 battalions and 118 guns, was to cover the withdrawal by holding the Tachiatun-Santaitzu-Yuanchentun line, drive the Japanese back to the line Tachiatzu-Kuochitun and withdraw to Hushihtai by detachments from his left flank.

On March 10 the left column of the Japanese Fifth Army and the Second Division, First Army, attacked the positions north of Fushun, Kapukai, and Tita, occupied by rear guards of the Russian First Army. These rear guards offered such resistance that the entire day was occupied by the Japanese in reaching a line through Manyutsuantzu. The Twelfth Division carried the line northeast of Holungtien and completed the occupation of the Hushinpu region. The Guards carried the positions on the heights northwest of Kiusan and followed the retreating rear guard to, and displaced it from, the line Pinglaotzu-Talingtzu, from where the artillery of the Japanese advance guard fired upon the retreating columns passing north along the railway and Tiehling road.

In the Japanese Fourth Army the Tenth Division carried the positions north of Tichiafang and east of Fuling and followed the rear guard to a line from east of Kuanchiakou to Tsaochiakou, where it was brought to a stand by a counter attack. About 11 a. m. it occupied the heights north of Tsaochiakou and fired on the retreating columns on the Tiehling road. The reserve of the Tenth Division, which at midnight had crossed the Hun northeast of Yankuantun, drove back a Russian force from near Sanchiatzu and Maochiatun and advanced to a line from northeast of Yulingpu to Erhtaitzu, where it was brought to a stand by the Seventeenth Corps retiring in front of the Japanese Sixth Division, which at midnight had crossed the Hun southwest of Yankuantun, and had overtaken a portion of the Seventeenth Corps at a point east of Mukden.

In the Japanese Second Army, as the Russians successively withdrew from south to north from their positions, the Fourth, Fifth, and Third Divisions advanced and drove off the opposing rear guards. The Fourth and Fifth Divisions reached points southwest and west of Mukden by nightfall, portions of both divisions entering the city about 7 p. m.

The Eighth Division, about noon, advanced to a line from Chinsotun through Tapingchuang to Hsiaochiatun and, at

night, with the main body, occupied the hills on which the north Tombs are situated.

In the Japanese Third Army the Seventh Division had made a night attack on the Santaitzu-Tachiatus line, in which 4 battalions succeeded in entering the walled inclosure of the north Tombs. The remainder of the attacking force was repulsed, thus leaving the 4 battalions isolated until toward evening, when Tachiatus was finally carried by the remainder of the Seventh Division.

The First Division carried Santaitzu about 5 p. m. and Yuanchentun a little later. The Ninth Division, assisted by the Second Artillery Brigade, carried Tungehangshan shortly after noon. The detachment in front of Waishutzu made an unsuccessful attack on and withstood a counter attack from Hushihtai.

General Milov succeeded in holding a line west of the railway, running from Waishutzu through Hsiaoehiaotzu to Yuanchentun, until the main bodies of the troops from the southwest had cleared the narrow space that still separated the Japanese First and Fourth Armies on the east from the Third Army on the west. The troops under General Milov had been reinforced during the day by various fractions from the retreating columns.

The battle of Mukden proper came to an end with the 10th of March, although many scattered detachments of Russians surrendered to the Japanese at a later date, and the pursuit did not end until Tichling had been occupied on March 16.

As a result of the battle the Japanese captured 66 guns, 62,200 rifles, 277,700 rounds of artillery ammunition, 26,640,000 rounds of rifle ammunition, the tramways that had been used to supply the Russian positions, and various quantities of supplies that had been abandoned by the Russians.

The Japanese reported their losses at about 50,000 killed and wounded. The Russians reported 273 officers and 8,626 men killed, 1,576 officers and 49,426 men wounded and 336 officers and 31,253 men missing, making a total of 2,185 officers and 89,305 men. Of the missing Russians, about 20,000 were made prisoners; the remainder properly belongs to the killed.

The Japanese forces that pursued the Russians were principally from the left column of the Fifth Army, the Second and Twelfth Divisions of the First Army, and, for a short distance, the Eighth Division of the Second Army.

The Russian rear guard took position at the Fan River; troops from the First Army on the right flank, and the divisions of General Mishchenko, who had now returned to duty, on the left. On March 14 the Japanese Second and Twelfth Divisions attacked this position. The advance troops suffered a repulse, but, with the arrival of reinforcements, the position was carried, and the pursuit continued through Tiehling, which was captured on March 15 after but slight resistance.

The Russian army occupied a position, through Fenghua and Ssuping kai, perpendicular to the railway, the left detachment at Heilungcheng.

The Japanese occupied a position through Fakumen, Changtufu, and Kaiyuan, the right detachment in the vicinity of Hsingking.

Contact between the two armies was regained and daily skirmishes, of greater or less severity, continued without any important change of position on the part of either combatant until an armistice between the opposing armies was entered into on September 14, 1905.

NAVAL OPERATIONS.

On February 6, 1904, Vice-Admiral Togo left Sasebo, conveying the transports *Tairen*, *Otaru*, and *Heijo*, carrying troops of the Twelfth Division to Chemulpo.

The fleet rendezvoused off Mokpo on the 7th, and Rear Admiral Uryu, with the Fourth Division, was detached to convoy the transports to Chemulpo, while the main fleet proceeded to the vicinity of the Elliott Islands. From this rendezvous one flotilla of torpedo boats and destroyers was sent to Talienwan Bay, another to Port Arthur, with orders to blow up the Russian vessels. The Talienwan flotilla found no Russian vessels and returned to the rendezvous. The other flotilla found the greater part of the Russian squadron lying outside the harbor of Port Arthur. The torpedo boats

advanced and discharged torpedoes, striking the *Czarevich*, *Retvizan*, and *Pallada*. All three vessels were seriously injured, but were subsequently repaired by the Russians.

Rear Admiral Uryu's division arrived off Chemulpo on the afternoon of February 8. The *Chiyoda*, which had been lying in Chemulpo Harbor since the preceding December, left on the 7th, about 11.30 p. m., and joined the Japanese division.

The Russian cruiser *Varyag* and gunboat *Koryetz* were also lying in the harbor. The latter steamed out on approach of the Japanese division and fired a shot, said by the Russians to have been accidental, and the Japanese replied by discharging two torpedoes, both ineffective. The *Koryetz* then returned to the harbor.

When the landing of troops from the transports was completed the Japanese transports and division steamed outside the harbor, and Rear Admiral Uryu demanded of the commander of the Russian vessels that they leave the harbor before noon of February 9 under penalty of being attacked in the harbor; such attack not to take place before 4 p. m., February 9, 1904.

The notice was also conveyed to the foreign warships in the harbor by the Japanese consul at Chemulpo.

About noon the Russian vessels steamed out, and, after an engagement of about thirty-five minutes, returned to the harbor, where the *Koryetz* was blown up by her commander, and the *Varyag* burned the same evening. The Russian transport *Sungari*, lying in the harbor, was burned to prevent capture by the Japanese.

The Japanese suffered no casualties. The Russians had about 100 killed and wounded. The wounded and other survivors were temporarily received on British, French, and Italian war ships.

Besides the torpedo-boat flotilla the Japanese division consisted of the *Asama*, *Chiyoda*, *Naniwa*, *Takashiho*, *Akashi*, and *Nitaka*.

On the morning of the 9th Admiral Togo approached Port Arthur with his squadron and engaged the Russian ships and batteries at long range for about two hours. As a result of this engagement, the *Poltava*, *Diana*, *Askold*, and *Norvik* were injured. The Russians lost 10 men killed and 2 officers and 44 men wounded. The Japanese lost 4 killed and 54 wounded,

3 officers being killed and 14 officers and cadets wounded. Several of the Japanese vessels were struck, but none seriously damaged.

The Japanese fleet, in addition to the destroyers and torpedo boats, contained the battle ships *Asahi*, *Mikasa*, *Hatsuse*, *Shikishima*, *Fuji*, *Yashima*, the armored cruisers *Tokura*, *Azuma*, *Iwate*, *Yakumo*, *Idzumo*, the protected cruisers *Taka-sago*, *Chitose*, *Yoshino*, *Kasagi*, and the dispatch boat *Tatsuta*. The Russian fleet, under Vice-Admiral Stark, in addition to the destroyers and torpedo boats, contained the battle ships *Retvizan*, *Sevastopol*, *Czarevich*, *Poltava*, *Petropavlovsk*, *Peresviet*, *Pobeda*, the armored cruiser *Bayan*, the protected cruisers *Askold*, *Diana*, *Pallada*, *Novik*, *Boyarin*, and gunboats *Bober*, *Otczhnî*, *Gremiashchî*, *Dzhizhit*, *Rasboinik*, and *Gilyak*.

On February 11 the Vladivostok squadron, consisting of the *Gromoboi*, *Rossia*, *Rurik*, and *Bogatir*, fired on the Japanese steamers *Naganura Maru* (700 tons) and the *Zensho Maru* (200 tons) in the vicinity of the Tsugaru Straits. The latter vessel escaped; the former was sunk, two of her crew being drowned.

On February 12 the Russian torpedo transport *Yenisei* struck a mine which she had just laid in Talienwan Bay, and sank; 4 officers and 92 men were lost. The *Boyarin* in endeavoring to aid the *Yenisei* also struck a mine and subsequently sank from her injuries.

On the night of February 13 the fourth torpedo-boat flotilla, consisting of the *Murasame*, *Harusame*, *Asagiri*, and *Hayatori*, under Commander Nagai, was dispatched against the Russian vessels at Port Arthur. The vessels of the flotilla were separated by stress of weather, and two failed to reach Port Arthur. The *Asagiri* arrived near the entrance about 3 a. m. on the 14th, was fired on, discharged a torpedo and retired. The *Hayatori* did likewise about 5 a. m. Neither torpedo was effective.

On February 16 the armored cruisers *Nisshin* and *Kasuga* (formerly *Moreno* and *Rivadavia*, each of 7,770 tons displacement and launched in 1903 and 1902, respectively, at Sestri Ponente, Italy), purchased by the Japanese from the Argentine Republic shortly before the outbreak of the war, arrived at Yokosuka.

FIRST ATTEMPT TO BLOCK PORT ARTHUR.

The First and Third Squadrons made an unsuccessful attempt on the morning of February 24 to block Port Arthur. Five steamers, the *Tenshin Maru* (2,942 tons), *Hokoku Maru* (2,766 tons), *Jinsen Maru* (2,331 tons), *Buyo Maru* (1,163 tons), and *Bushu Maru* (1,249 tons), loaded with artificial stone and manned by 77 volunteer officers and crew, were to be taken to the entrance and there sunk by being blown up. A torpedo-boat flotilla composed of the *Murakumo*, *Yugiri*, *Shiranui*, and *Kagero*, under command of Captain Mano, was to reconnoiter and destroy the Russian ships. The torpedo boats *Hayabusa*, *Kasasagi*, *Manazuru*, *Chidori*, and *Tsubanu* were to pick up the crews of the sunken vessels.

About 2.30 a. m. the Russian searchlights revealed the presence of the Japanese vessels, which were fired upon by the fortifications and the *Retrizan*, which was still lying beached near the entrance to the harbor, under Golden Hill. The Russian guard ship was driven back by the torpedo-boat flotilla. The *Tenshin Maru* grounded on the east coast of Laotichshan in endeavoring to avoid the Russian searchlights and after being more or less damaged by fire. The steering gear of the *Bushu Maru* was struck and the vessel grounded not far from the *Tenshin Maru*, and was then blown up by the crew. The *Buyo Maru* was so seriously damaged that she sank before reaching the harbor entrance. The *Hokoku Maru* and *Jinsen Maru* reached the entrance and were successfully blown up, the former near the lighthouse on Tiger's Tail, the latter under Golden Hill, near the *Retrizan*.

With the exception of three men slightly wounded, the crews of the vessels were uninjured and all safely picked up, after having taken to their boats, by the destroyers. The last of them were not picked up until the afternoon. One man was killed on one of the destroyers.

On February 24 the First and Third Squadrons approached Port Arthur and engaged in an exchange of long-range fire with the *Bayan*, *Askold*, and *Novik* lying outside the harbor, and into which they withdrew. During this engagement the Second (Armored Cruiser) Squadron, under Vice-Admiral Kamimura, discovered and chased two Russian destroyers

near Laotiehshan, coming from a westerly direction. One of the destroyers escaped; the other, the *Vnuchitelni*, was driven into Pigeon Bay and destroyed.

On February 19 Admiral Makarov left St. Petersburg, to supersede Admiral Stark in command of the Russian fleet at Port Arthur.

On March 6 the Japanese Armored Cruiser Squadron (7 ships) bombarded Vladivostok from a range of about 5 miles, but received no reply from the fortifications.

On the 9th the Russians sank two vessels—the *Harbin* and the *Hailar*—outside the entrance to the harbor, for the purpose of deranging any subsequent attempt to block Port Arthur. Two other vessels were sunk later for the same purpose.

During the early morning of March 10 a flotilla of Japanese destroyers, commanded by Captain Asai, laid mines outside Port Arthur Harbor. At the same time a second flotilla encountered 6 Russian torpedo-boat destroyers and a severe engagement at short range ensued. Considerable damage resulted on both sides. The Russian destroyer *Stereguschi* was finally taken in tow by the Japanese destroyer *Sazanami*, but the towline parted and the former sank.

The *Bayan* and *Novik* steamed out to the assistance of the *Stereguschi*, but returned to the harbor on the approach of the Japanese fleet, which engaged in a long-range fire with the fortifications.

In the engagement between the destroyers the Japanese lost 9 killed and 12 wounded. The Russians lost 3 killed, 34 wounded, and 4 captured on the *Stereguschi*.

On March 16 a Russian destroyer—the *Skori*—while searching for mines near Port Arthur struck one and was lost.

On the night of March 21-22 two flotillas of Japanese destroyers laid mines in the outer harbor of Port Arthur. The main squadron arrived off the harbor on the morning of the 22d, a portion of the fleet having proceeded to Pigeon Bay, and a long-range fire was exchanged with the fortifications, a portion of the fire being indirect and over the Laotiehshan. The Russians on land had 5 killed, 9 wounded, and 1 accidentally injured.

SECOND ATTEMPT TO BLOCK PORT ARTHUR.

On March 27, about 3 a. m., the Japanese made a second attempt to block Port Arthur, sending 4 vessels to be sunk in the channel, under the protection of the destroyers *Shirakuma*, *Kasumi*, *Asashio*, *Akotsuki*, *Ikazuchi*, *Akebono*, *Oboro*, *Inazuma*, *Usugumo*, *Sazanami*, *Shinonome*, and the torpedo boats *Karigane*, *Aotaka*, *Hato*, *Tsubanu*, *Kasasagi*, and *Manazuru*.

The *Chiyo Maru* (1,746 tons) anchored about one-half chain from shore, on the western side of Golden Hill, and blew herself up. The *Fukui Maru* (1,294 tons) advanced a little farther past the port side of the *Chiyo Maru*, was struck by a Russian torpedo and then blew herself up. The *Yahiko Maru* passed the port side of the *Fukui Maru*, anchored, and blew herself up. The *Yoneyama Maru* (2,693 tons) collided with a Russian destroyer, then passed between the *Chiyo Maru* and *Fukui Maru* and reached the middle of the fairway, where she was struck by a Russian torpedo, blown up and sunk, the momentum driving her over to the left shore.

Among the crews of the blocking vessels there were killed 1 officer (Commander Hiure on the *Fukui Maru*) and 3 men; wounded, 3 officers and 6 men.

The Russian destroyer *Silini* in engagement with the Japanese destroyers, had 7 killed and 13 wounded, stranded on the rocks near Golden Hill, but was taken into the harbor.

On March 30 the commander of the *Akitsu-shima* accompanied the Japanese consul-general at Shanghai in the inspection of the arms removed from the Russian gunboat *Mandzhur*, which had been in that port since the outbreak of the war and from which the vital parts of machinery had been removed on March 28.

During the early morning of April 13 the Japanese mine ship *Koryu Maru* succeeded in laying some mines near the entrance to Port Arthur, being accompanied by the fourth and fifth destroyer flotillas and the fourteenth torpedo-boat flotilla. At dawn the second destroyer flotilla discovered the Russian destroyer *Strashni*, which had become separated from her own flotilla during the night while cruising outside the port, and after a short engagement sank her. A second

Russian destroyer, coming from the direction of Laotiehshan, was attacked, but escaped into the harbor.

The *Bayan* approached and picked up as many of the *Strashni's* crew as possible, at the same time returning the fire of the destroyers and the Japanese Third Squadron, which had arrived off Port Arthur about 8 a. m. The *Norvik*, *Askold*, *Diana*, *Petropavlovsk*, *Pobieda*, and *Poltava* joined the *Bayan* and followed the slowly retiring Third Squadron about 15 miles to the southeast. The Japanese First Squadron, which was concealed in the fog about 30 miles off and had been called by wireless telegraphy, arrived. The Russian fleet then retired toward the harbor. About 8.30 p. m. the *Petropavlovsk* struck two of the mines laid by the *Koryu Maru* the preceding night; the explosion extended to the boilers and magazines, and the vessel broke in two and sank. Her complement was 650, and only about 6 officers and 30 sailors escaped. Vice-Admiral Makarov, Rear-Admiral Molas, and Captain Jakovlev were among the killed; the Grand Duke Cyril was among those who escaped. The *Pobieda*, while endeavoring to rescue the survivors of the *Petropavlovsk*, also struck one of the mines and was seriously injured. She succeeded in reaching the harbor, however, and was subsequently repaired.

On the night of April 25 the *Kinshu Maru*, which had the preceding day carried a company of Japanese infantry from Gensan to Iwon, and again had the company on board, was torpedoed and sunk by a vessel of the Vladivostok squadron. Those troops on board which had not taken advantage of the one hour granted to leave the vessel, thus becoming prisoners, were lost.

Vice-Admiral Kamimura's (armored cruiser) squadron, after searching for the survivors of the *Kinshu Maru*, approached Vladivostok and fired on two Russian torpedo boats, which retired to the harbor, and the fortifications. The latter returned the fire. No loss was reported on either side.

In the latter part of April the Russian destroyer *Beschumni*, while searching for mines, struck one and was seriously damaged. She succeeded in returning to port, and was subsequently repaired.

THIRD ATTEMPT TO BLOCK PORT ARTHUR.

About 2 a. m. on May 3 the Japanese made a third attempt to block the entrance to Port Arthur. The vessels actually sunk consisted of the *Tatomi Maru* (1,953 tons), *Sagami Maru* (1,926 tons), *Mikawa Maru* (1,967 tons), *Sakaru Maru* (2,978 tons), *Odaru Maru* (2,547 tons), *Asagao Maru* (2,464 tons), *Aikoku Maru* (1,781 tons), and *Yedo Maru* (1,724 tons). Four other vessels, the *Fusan Maru*, *Nagato Maru*, *Shibata Maru*, and *Kokura Maru* were also to be sunk, but received the signal of recall during the night after the fleet was scattered by storm and did not proceed to the entrance.

The convoy of the blocking vessels, under Commander Mineo Hayashi, consisted of the gunboat *Akagi* (Commander Hideshin Fujimoto), gunboat *Chokai* (Commander Danjiro Iwanura), the second destroyer flotilla (Commander Ichiro Ishida), the third destroyer flotilla (Commander Mitsukane Tsuchiya), the fourth destroyer flotilla (Commander Gun-kichi Nagai), the fifth destroyer flotilla (Commander Ganjiro Mano), the ninth torpedo-boat flotilla (Lieutenant-Commander Michisuke Olaki), and the fourteenth torpedo-boat flotilla minus the *Kasasagi* and *Manazuru* and plus torpedo boats Nos. 67 and 70 (Commander Yoshimaru Sakurai). Of the eight steamers, five, the *Mikawa*, *Tatomi*, *Yedo*, *Odaru*, and *Sagami*, reached the entrance, the *Mikawa* penetrating beyond the boom that had been stretched. The *Asagao* was sunk near the shore of Golden Hill; the *Sakaru* and *Aikoku* sank before reaching the entrance. The latter three were probably sunk by Russian mines, torpedoes, and fire, while the first five were probably sunk by their own crews as well as from injuries inflicted by the Russians.

Of the crews of these steamers the Japanese reported 5 killed, 88 missing, and 23 wounded, while 41 were rescued uninjured. The entire crew of the *Sakaru*, *Odaru*, *Asagao*, and *Sagami* were reported as killed or missing.

The Russians reported that they rescued 30 Japanese, among whom were 2 officers severely wounded.

The Japanese torpedo boat No. 67 had her boiler damaged by shells, in addition to 3 of her crew being wounded, but was towed out of danger by torpedo boat No. 70. The destroyer *Aotaka* had her engine on the port side damaged

and 1 man killed. The destroyer *Hayabusa* had 1 man killed.

A division of the Third Squadron, Rear-Admiral Dewa in command, arrived off the harbor about 6 a. m.; a division of the First Squadron, Rear-Admiral Nashiha in command and Vice-Admiral Togo also present, arrived at 9 a. m. Both divisions covered the action of the destroyers and torpedo boats, searching for the survivors throughout the day.

The total value of the 17 vessels used by the Japanese in the three attempts to block Port Arthur is given as 3,000,000 yen.

On May 12, while endeavoring to destroy a Russian mine in Kerr Bay, the Japanese torpedo boat No. 48 was sunk by its unexpected explosion, 14 of the crew losing their lives.

The Third Squadron continued the search for mines in that locality, and on the 14th, when about to end the search for that day, a mine exploded under the stern of the dispatch boat *Miyako*, which sank in twenty-three minutes. Of the crew, 2 were killed, 1 severely wounded, and 21 slightly wounded.

During this searching for mines the various vessels of the squadron occasionally bombarded points on land, some of which were occupied by Russians who were opposing the searching for mines. No casualties seem to have resulted on either side.

On May 14, during the absence of the blockading vessels, the Russians laid mines off Port Arthur in the path in which the blockading vessels usually cruised. The blockading vessels returned on May 15; the *Hatsuse* struck one of the mines and, about thirty minutes later, struck a second mine which exploded the magazine, sinking the vessel almost immediately. About 300 of her complement of 741 were saved. A destroyer flotilla emerged from Port Arthur, but was repulsed by the other Japanese vessels. The *Yashima* also struck a mine, was taken in tow, but sank before reaching a place of safety.

On the same day the *Kasuga* collided with the *Yoshino*, in a dense fog at sea near the Shantung promontory, striking her on the port side near the stern. The *Yoshino* quickly sank, only about 90 of her complement of 360 being saved.

On May 16 and 17 a division of the Third Squadron, Rear-Admiral Togo commanding, reconnoitered the coast near Kaiping, firing at some Russian troops near the shore, then proceeded to Chinchou Bay, dragged for mines and entered the bay, the gunboats proceeding to the head of the bay and firing on the railway bridges, buildings, and one military train which was passing. On the 17th, also, the destroyer *Akatsuki*, while engaged in the blockade of Port Arthur, struck a mine and sank. The gunboat *Oshima* was sunk in a collision on the 18th while cruising in Liaotung Bay, cooperating with the army.

On May 20 a gunboat detachment and several torpedo-boat and destroyer flotillas approached close to the harbor of Port Arthur to reconnoiter and plant mines. In the firing that ensued several of the vessels were struck, but none seriously damaged. The destroyer *Akatsuki* was struck by a shell which killed her commander, Lieutenant Naojira Suyetsuga, and 24 sailors.

On May 20 the Russian cruiser *Bogatir* struck a rock at the entrance to Vladivostok Harbor. She was afterwards floated, repaired, and held at Vladivostok ready for use.

On May 26 four gunboats and a torpedo-boat flotilla assisted the Japanese Second Army in the attack on Nanshan from Chinchou Bay. The gunboats *Akagi* and *Chokai* with the first torpedo-boat flotilla approached the shore and engaged in the morning. A shell grazed the *Chokai*, wounding Lieutenant Kohno, killing 2 men, and wounding 2. A little later the gunboats *Tsukushi* and *Heiyen* approached, after soundings had been taken by a detachment of torpedo boats, and joined in the bombardment, but withdrew about 11 a. m. on account of the ebbing tide.

The *Akagi* and *Chokai* and a part of the torpedo-boat flotilla remained, taking part in the battle until the end. A shell exploded on the side of the *Chokai*, killing Commander M. Hayashi and wounding Lieutenant M. Sato and 3 men.

Reporting on the battle of Nanshan, General Oku said: "In concluding this report we profoundly thank the navy for its invaluable assistance."

During the same battle the Russian gunboat *Bober* bombarded the Japanese left flank from Talienwan Bay, causing serious loss.

On the night of May 26, while reconnoitering the coast of Laotichshan, the Russian destroyer *Vnimatelni* ran on the rocks and was lost.

On the 7th and the 8th of June a division of the Third Squadron bombarded various points on the coast near Kaiping, disturbing some detachments of Russian troops. On the 13th the mine-laying ship *Taihoku Maru*, by the unexpected explosion of a mine she was laying, lost 19 killed and 17 wounded.

On June 15 the Vladivostok squadron, *Rossia*, *Rurik*, and *Gromoboi*, encountered several Japanese transports and merchantmen near Okinoshima Island, sank the *Izami Maru* and *Hitachi Maru* and disabled the *Sado Maru*. The *Hitachi Maru* had on board about 1,095 of the Guards Kobi reserves and a mercantile crew of 120. Of those on board the 2 vessels 77 Japanese were made prisoners. Of the crew of the *Hitachi* 17 out of 102 were picked up either by the *Sado* or by boats sent out for that purpose. The greater part of the troops on board were killed by the Russian fire, or were drowned.

Of the *Sado Maru* 8 were made prisoners, 83 escaped, and 29 were lost. Many jumped overboard, thinking the vessel was sinking, and subsequently regained the *Sado* after the Russian vessels had withdrawn. Of the *Izami Maru* 47 were made prisoners and 37 were lost.

The Japanese Second Squadron, Vice-Admiral Kamimura commanding, searched the waters near Okinoshima for several days, but was unable to discover the Vladivostok squadron except with the scout boat *Tsushima*.

On June 23 the Russian fleet made a sortie from Port Arthur. Repairs had been made to such an extent that the following vessels took part: *Bayan*, *Diana*, *Askold*, *Sevastopol*, *Poltava*, *Peresviet*, *Pobieda*, *Retvizan*, *Czarevich*, *Pallada*, *Gremiashchi*, *Otrazhni*, *Gardamak*, *Vsadnik*, and 13 torpedo boats.

The fleet began emerging in the early morning, and the Japanese destroyers, on guard off the harbor, notified the various detachments of their fleet, which soon began to appear from various directions.

After emerging from the entrance the Russian fleet anchored until about 2 p. m., when it got under way, preceded by tend-

ers and torpedo boats dragging for mines, which was opposed by the Japanese torpedo boats.

The Russian fleet continued on a southerly course until nearly sunset and then turned toward Port Arthur. The Japanese fleet had completed its concentration, and at about 9.30 p. m. the fourteenth torpedo-boat flotilla, followed by the fifth made an attack on the rear of the Russian fleet when the latter was about 5 miles from Port Arthur. The Russian vessels did not attempt to enter at night, but anchored just outside the harbor, where they were attacked by torpedo boats several times during the night.

The *Sevastopol* either struck a mine or was struck by a torpedo. The best evidence is that it was a torpedo fired from the *Shirakumo*, Lieutenant-Commander Wakabayashi commanding, which succeeded in approaching closely by making a detour under cover of Yenchang promontory.

Early the next morning all the Russian vessels, including the *Sevastopol*, steamed or were towed into the harbor.

The *Shirakumo* was struck by a shell that caused a fire, killed 3 men and wounded 1 officer and 2 men. The *Chidori* was struck in her aft engine room by a shell which did not explode. A cadet on board No. 53 was wounded. Nos. 64 and 66 were struck by shells, but not seriously injured.

On the night of June 27 the twelfth torpedo-boat flotilla, Lieutenant-Commander Yamada commanding, attacked and claimed to have sunk the Russian patrol ship at Port Arthur, and also a Russian destroyer in the ensuing fight. The loss of these vessels was not verified. The Japanese lost 14 killed and 3 wounded.

On June 30 a Russian torpedo-boat flotilla with the transport *Lena* made a reconnoissance of the port of Gensan, sank a Japanese steamer and sailing vessel and fired on the Japanese settlement and troops, wounding 2 Japanese and 2 Koreans. Some of the shells started conflagrations which were, however, soon extinguished.

On July 1, at 6.20 p. m., the Japanese Second Squadron, Vice-Admiral Kamimura commanding, sighted the Vladivostok squadron, Vice-Admiral Bezobrazov commanding, as it was about to pass south through the eastern channel of Tsushima Straits. The Russian squadron turned to the north-east, followed by the Japanese squadron, whose torpedo-boat

flotilla closed to within a distance of about 2 miles, and was fired on by the Russian vessels. At about 8.50 p. m. the Russian vessels extinguished all lights and eluded their pursuers.

On July 5 the Japanese gunboat *Kaimon* struck a Russian mine off Dalny and sank; her commander, Commander Takahashi, a paymaster, gunner, and 19 sailors were lost.

In the early morning of July 9 the sixth torpedo-boat flotilla under Lieutenant-Commander Uchida, approached the entrance of Port Arthur, and No. 58, Lieutenant Nakamuda commanding, discharged a torpedo, which was not effective, at the *Askold*. Nos. 58 and 59 of the Japanese flotilla each had 1 man wounded by the Russian fire.

On July 9, about 7 a. m., the Russian vessels *Bayan*, *Diana*, *Pallada*, *Poltava*, *Novik*, 2 gunboats, and 7 destroyers came out of Port Arthur, preceded by a number of vessels dragging for mines. The Japanese torpedo-boat flotilla fired on them to retard the searching for mines, and was followed by a portion of the Third Squadron which also exchanged shots with the *Bayan* about 2 p. m. About 4 p. m. the Russian vessels returned to the harbor. There was 1 sailor wounded on the Japanese destroyer *Asashio*.

In the early morning of July 11 the Japanese sixth torpedo-boat flotilla again approached the entrance to Port Arthur and endeavored to torpedo the Russian patrol boat. Nos. 57 and 59 both discharged torpedoes, but without effect.

On July 15 the *Bayan*, flying the flag of Rear-Admiral Reitzenstein, *Retvizan*, *Askold*, *Novik*, the gunboats *Otrazhni*, *Gremiashchi*, and *Gilyak*, and a torpedo-boat flotilla enfiladed the left of the Japanese line near Port Arthur and then returned to the harbor.

On July 20 the *Rossia*, *Gromoboi*, and *Rurik*, under Rear-Admiral Zhissen, passed through the Tsugaru Straits for the east coast of Japan to harass Japanese shipping, draw the blockading squadron away from Port Arthur, and thus allow the Russian squadron to quit Port Arthur and reach Vladivostok.

The raid resulted in considerable injury to the Japanese coasting trade. In addition, the German steamer *Arabia* was seized 100 miles off Yokohama on July 22, and sent as prize to Vladivostok on account of having in cargo contra-

band consisting of railway material and flour destined for Japan.

On July 23 the *Knight Commander*, an English ship, stopped after the Russian vessels had fired 4 guns. She was carrying to Japan 3,500 to 4,000 tons of cargo, mostly railway material. Stating that she was engaged in the transportation of contraband of war and that her coal capacity was so short they could not send her to Vladivostok without danger to themselves, the Russian took over her crew and papers and then sank her.

On July 24 the German steamer *Thea* was overhauled and sunk, being regarded by the Russians as a prize, as stipulated in the law.

On July 26 the *Bayan*, *Pallada*, and *Novik* opened fire against the left of the Japanese line near Port Arthur. The *Matsushima*, *Itsukushima*, *Chiyoda*, two other second-class cruisers, and a torpedo-boat flotilla approached the Russian ships, which, after a short engagement, returned to the harbor.

On July 30 the Russian Vladivostok squadron retired westward through the Tsugaru Straits, reporting they had seen at about 3 p. m. a cruiser, 6 torpedo boats, a sail ship, and a coast defense ship of the *Saiyen* type, that these ships were far back of the squadron and retired about 5 p. m.

During the raid the squadron sank the Japanese steamer *Rakashima Maru*, and the sailing vessels *Jizai*, *Fukushige*, *Hokusei*, and *Kyuko*.

In the meantime the Russian volunteer fleet steamers *Petersburg* and *Smolensk* passed through the Bosphorus on July 4 and 6, respectively, were raised to the rank of Russian second-class cruisers, and searched several neutral vessels, including the British steamers *Malacca*, *Formosa*, and *Ardova*, and the German steamers *Prinz Heinrich*, *Scandia*, and *Halsatia*.

The *Malacca* was seized as prize on the claim that she was carrying war material. The British Government, however, stated such material belonged to itself. After diplomatic correspondence the *Malacca* was released and searches and seizures by the *Petersburg* and *Smolensk* ceased.

On July 24, at about 3 a. m., the fourteenth torpedo-boat flotilla and gunboats Nos. 10 and 11, commanded by Lieutenant Shozo Kuwajima and accompanied by torpedo boats

sent by the *Mikasa* and *Fuji*, attacked three Russian destroyers in Takhe Bay, where they were guarding the right flank of the Port Arthur defenses.

The torpedo boats sent from the battle ships torpedoed the *Burakov* and *Boerovi*. The *Burakov* was sunk and the *Boerovi* very seriously damaged, but managed to reach Port Arthur.

On July 26, while dragging for mines near Lungwangtang (Swansons Point), one of the Japanese gunboats got the clearing rope entangled in her propeller, began drifting toward Yenchang promontory, and was fired upon by the fortifications and attacked by one or more Russian torpedo boats that steamed up and discharged torpedoes. Commander Hirose, commanding the clearing party, approached on another gunboat and towed the disabled vessel out of danger. Commander Hirose, Lieutenant Kamura, and 9 men were wounded and 3 men were killed.

On July 26, while cruising off Port Arthur, the Japanese cruiser *Chiyoda* struck a mine, but was towed to Dalny.

On July 27, while returning to Port Arthur from a reconnaissance, the Russian cruiser *Bayan* struck a mine near the entrance, but was towed into the harbor.

On August 2 the Russian gunboat *Sivuch*, which had retired up the Liao River on the approach of the Japanese, was destroyed to prevent her falling into their hands.

During the afternoon of August 5 fourteen Russian destroyers emerged from Port Arthur and separated into three divisions; the first, of four vessels, steamed southwest; the second, of seven, steamed south; the third, of three, steamed toward Yenchang promontory. After an exchange of fire with two Japanese destroyers, *Akegono* and *Oboro*, commanded, respectively, by Commanders Kusumi Masao and Takemura Bungo, and the *Ikazuchi*, Commander Shinohara Rishichi, the Russian destroyers returned to the harbor. There were apparently no casualties on either side.

On August 9, 15 cm. shells from a Japanese shore battery struck both the *Retvizan* and *Peresviet* while at anchor in the west port. The former was damaged considerably, the latter but slightly. Both took part in the sortie of the following day.

At about 5 a. m., August 10, the Russian fleet of *Czarevich* (flagship of Rear Admiral Witgeft), *Retvizan*, *Pobieda*, *Peresviet* (flagship of Rear Admiral Prince Oukhtomski, commanding battleship division), *Sevastopol*, *Poltava*, *Askold* (flagship of Rear Admiral Reitzenstein, commanding cruiser division), *Diana*, *Pallada*, *Novik*, 8 destroyers and the hospital ship *Mongolia*, began emerging from Port Arthur, all being out about 8 a. m.

The Japanese torpedo boats on watch about 6 miles out were soon reinforced, the *Yakuma*, *Kasagi*, *Takasago*, and *Chitose* appearing about 15 miles to the southwest; the *Mikasa*, *Asaki*, *Fujii*, and *Shikishima* appearing about 12 miles to the south and being joined by the *Nisshin* and *Kasuga* about 10 miles to the southeast. A little later the *Akashi*, *Suma*, *Izumi*, *Akitsushima*, *Yayeyama*, and *Asama* joined the other Japanese vessels.

The Russians claimed that the Japanese torpedo boats, of which a total of 30 took part in the engagement, steamed ahead of the Russian column sowing floating mines. The Japanese denied using any mines on this occasion.

After proceeding south about 10 miles the Russian fleet turned to the east and was attacked by the Japanese, about 1 p. m., at a point about 30 miles from Port Arthur. The Russian fleet then turned toward Shantung. The engagement continued intermittently until after sunset, being heaviest from about 4 to 4.30 p. m., and again from 7 to 8 p. m., by which time the range between the leading ships of the opposing fleets was reduced to about 5,000 yards.

At about 8 p. m. the steering gear of the *Czarevich* became disabled, causing the vessel to turn sharply to port. She was followed by the *Retvizan* and a portion of the other vessels. The cause of the *Czarevich* turning to port was soon discovered and considerable confusion resulted in the Russian fleet. During the confusion the Japanese vessels ranged ahead. The main portion of the Russian fleet, except the *Czarevich*, *Diana*, *Askold*, and *Novik*, turned to starboard and headed for Port Arthur, the vessels separating.

The Japanese suffered a loss of 70 killed, including 10 officers, and 158 wounded, including 13 officers. On August 12 Admiral Togo reported that the damage to his ships had been provisionally repaired.

The Russians lost 21 officers and 324 men killed and wounded. Among the killed was Admiral Witgeft, commanding the Russian fleet.

On August 11 the *Retvizan*, *Sevastopol*, *Pereseviet*, *Poltava*, *Pobieda*, *Pallada*, and the hospital ship *Mongolia* returned to Port Arthur, the first four badly damaged. Three torpedo boats also returned to Port Arthur.

The *Czarevich* and 3 destroyers went to Kiao Chow; the *Askold* and the destroyer *Grozovoi* to Shanghai; the *Diana*, to Saigon; all were subsequently disarmed. One destroyer, the *Burni*, went ashore near Weihaiwei. The *Novik* went to Kiao Chow, but cleared from the port and endeavored to reach Vladivostok.

On the night of August 10 the Russian destroyer *Ryeshitelni* left Port Arthur for Chefoo with dispatches. She was discovered the next day by the Japanese destroyers *Asashio* and *Kasumi*, under Commander Fujimoto. At 3 a. m. on the 12th Lieutenant Terashima with a detail of 10 men was sent on board to inform the Russian commander that since he had been in the port more than twenty-four hours he must issue from the harbor or surrender. During the ensuing discussion the Russian commander gave orders to blow up the vessel, seized Lieutenant Terashima, and jumped overboard. There was a struggle between the Russian and Japanese sailors, an explosion occurred in the hold, and the vessel, which had been disarmed in part, was towed out of the harbor by the Japanese at 5.15 a. m.

A protest was lodged with the Chinese Government by Russia and China demanded the return of the *Ryeshitelni*. Japan declined to accede to the demand, claiming that the harbor of Chefoo was not properly neutral territory since the Russian consulate operated a system of wireless telegraphy with Port Arthur, that the harbor had been converted into belligerent territory by the entry of the *Ryeshitelni*, that the vessel had not been disarmed at the time of Lieutenant Terashima's visit, and that the crew of the *Ryeshitelni* began hostilities.

On August 11, while bombarding the left of the Japanese Third Army near Lungwantang, the Russian gunboats *Gilyak* and *Otvazhni* were attacked and driven back to Port Arthur by the Japanese gunboats *Maya* and *Akagi*.

On August 14 at dawn Vice-Admiral Kamimura, with the armored cruisers *Idzumo*, *Iwate*, *Azuma*, and *Tokiwa*, sighted the Vladivostok Squadron under Admiral Zhissen, and consisting of the *Rurik*, *Rossia*, and *Gromoboi*, about 20 miles off Ulsan, southeastern Korea, proceeding toward Port Arthur. The Russian fleet turned northward and firing began about 5.30 a. m. The *Rurik* was struck by a shell which wrecked the steering gear and left the vessel unmanageable. The other two vessels turned back several times to cover the *Rurik* and allow repair of her steering gear. The attempt failed, the *Rurik* began sinking by the stern, and the other two vessels steamed northward. The *Naniwa* and *Takashio*, which had now arrived, continued the engagement with the *Rurik*, and Admiral Kamimura with the other vessels pursued the *Rossia* and *Gromoboi* for about two hours and then turned back.

In the meantime the *Rurik* had sunk and the survivors were being picked up by the *Naniwa* and *Takashio*, assisted by the *Nitaka*, *Tsushima*, *Chiyoda*, and a torpedo boat flotilla, which had arrived on the scene. The *Idzumo* also returned in time to assist in the rescue.

Of the officers and crew of the *Rurik* 437 were picked up uninjured, 176 were picked up wounded. Her complement was 768. On the other two Russian vessels there were 140 killed and 313 wounded.

The Japanese casualties were 45 killed and 65 wounded. Admiral Kamimura reported the damage to his ships as slight. The *Iwate* went to Sasebo for repairs and replaced one of her heavy guns.

The *Rossia* and *Gromoboi* succeeded in reaching Vladivostok, although seriously injured. The *Rossia* was struck by 11 shells below and near the water line, the *Gromoboi* by 5. Each lost about half of its complement of officers and many sailors in killed and wounded.

On August 20 the *Novik*, which went to Kiao Chow after the naval engagement of August 10 and then sailed for Vladivostok, passing to the east of Japan, and the *Tsushima* engaged each other for about one hour near Korsakov, Sakhalin. After the engagement the *Novik* proceeded to the anchorage and the *Tsushima* drew off for repairs, having

been struck by a shell in the bunkers and so badly damaged as to list.

The *Chitose* arrived toward evening and on the 21st proceeded to Korsakov. The *Novik* was found beached and her crew was abandoning her. The *Chitose* fired on her for nearly an hour, approaching to about 2,500 meters.

A subsequent examination by the Japanese found the *Novik* listed to starboard about 30°, bow submerged except the fore deck, upper deck awash more than knee-deep.

On August 23 the *Sevastopol*, while outside the harbor bombarding the left flank of the Japanese Third Army, struck a mine and was towed back into Port Arthur.

On August 24 the Russian destroyer *Vunosljeni* struck a mine and sank about 2 miles off Laotiehshan; a second destroyer struck a mine about the same time but was towed back into Port Arthur.

On September 3 the Japanese destroyer *Hayatori*, while engaged in the blockade of Port Arthur, struck a mine and sank.

On September 11 the Russian transport *Lena*, which had been converted into a cruiser with an armament of 23 guns and a complement of 16 officers and 488 men, under command of Captain Berlinski, entered San Francisco Harbor after thirty-one days out from Vladivostok. She was subsequently disarmed and her crew interned until the end of the war.

On September 18 the Japanese coast defense vessel *Heiyeu* struck a mine in Pigeon Bay and sank; but 4 out of her complement of 289 were saved.

During the month of September the Japanese cruiser *Otawa*, 3,048 tons displacement, 18 guns armament, and maximum speed of 21 knots, was completed.

On the night of October 21 the Baltic Fleet, or Second Pacific Squadron, while passing over the Dogger Banks in the North Sea, fired on boats of the Hull fishing fleet, sinking the *Crane*, killing the captain and mate and wounding the remainder of the crew, 6 in number.

The Russian admiral reported he was attacked by two strange torpedo boats and that the firing was produced by such attack. The fishermen claimed no vessels other than

the Russian and fishing boats were in that vicinity. After several days of excited correspondence the two governments agreed to submit the matter to an international commission of inquiry composed of five naval officers of high rank.

The composition and organization of the Second Pacific Squadron, commanded by Vice-Admiral Rozhdestvenski, were as follows:

First battleship division: *Kniaz-Suvarov* (flying the flag of Admiral Rozhdestvenski, in immediate command of this division), *Emperor Alexander III*, *Borodino*, and *Orel*.

Second battleship division: *Oslabya* (flying the flag of Rear-Admiral Felkersham, commanding the division), *Sissoi Veliki*, *Navarin*, and the armored cruiser *Admiral Nakhimov*.

Cruiser division: *Dmitri Donskoi* (flying the flag of Rear-Admiral Enquist, in command of the division), *Aurora*, *Svietlana*, *Almaz*, *Zhemtchug*, *Kuban*, *Ural*, and *Terek*.

First flotilla of destroyers: (Captain Shamov in command) *Bodri*, *Buini*, *Bistri*, *Bezupreshchni*.

Second flotilla of destroyers: (Captain Baranov in command) *Bravi*, *Biedovi*, *Blestiashechi*.

Division of military transports and auxiliary ships.

Military transports: *Kamtchatka* (repair ship) and *Anadir*.

Auxiliary ships: *Korea*, *Malaya*, *Meteor* (condensing plant), *Kitai*, *Kniaz-Gortchakov*, *Jupiter*, *Mercury*, *Vladimir*, *Voronezh*, *Tambov*, *Yaroslav*, *Kiev* (flying the flag of Captain Radlov, in command of the division), and *Orel* (hospital ship).

The fleet proceeded in two sections, the first, under Rozhdestvenski and composed of the heavier draft vessels, proceeding via the Cape of Good Hope, the second, under Felkersham, proceeding via the Suez Canal, and rendezvoused at Nossi Be, northeast of Madagascar, where it was joined by a complementary division which passed the Suez Canal in January, 1905. This division, provisionally under the command of Captain Dobrotvorski, composed of the cruisers *Oleg*, *Izumrud*, *Don*, *Rion* (*Smolensk*), and *Dneiper* (*Petersburg*) and the destroyers *Grozni*, *Gromki*, *Prozorlivi*, *Pronzitelni*, and *Pritki*, was distributed among the divisions of the Second Squadron.

The transport *Irtish* passed through the Suez Canal on January 28, 1905, to join the Second Squadron.

Later the squadron was again reenforced in the neighborhood of Kamranh Bay, Cochin China, by the first division of the Third Squadron, which left Libau February 15, 1905, and was composed of *Emperor Nicolas I*, squadron battleship (flying the flag of Rear-Admiral Nebogatov, in command of the division); *Admiral Seniavin*, *General-Admiral Aprarin*, *Admiral Ushakov* (armored guardships); *Vladimir-Monomach* (armored cruiser); *Russ* (sea tug); *Zenia* (repair ship); *Ocean* (transport); *Kostroma* (hospital ship).

On November 6, 1904, the Japanese gunboat *Atago* was wrecked on a submerged rock in the Gulf of Pechili.

On November 16 the Russian destroyer *Rastoropni* entered Chefoo with despatches from Port Arthur. The crew was landed and the vessel blown up by her commander.

On November 30 the Japanese cruiser *Saiyen* struck a mine, while cooperating with the Third Army at Port Arthur, and sank. Of her complement of 16 officers and 213 men, the commander, Captain Tajima, and 38 others were lost.

On December 12 the *Sevastopol*, which had anchored outside the harbor at Port Arthur, was attacked by Japanese torpedo boats. All other battleships and cruisers in Port Arthur had been so badly damaged, either by the Japanese heavy siege guns and naval batteries or intentionally by the Russians, as to be helpless. In the early morning of the 13th the attack was renewed, and one Japanese torpedo boat was struck by a shell and so badly damaged that she was towed away by one of her comrades. A third attack was made about 6 a. m. The torpedoes launched by the Japanese, while exploding, did not produce their full effect on account of torpedo nets and other defensive means employed by the *Sevastopol*. There were three Japanese casualties in the attack at 6 a. m., 3 torpedo boats receiving one shot each.

On December 12 the Japanese protected cruiser *Takasago* struck a mine off the entrance to Pechili Gulf and sank. But 133 of her complement of 500 were saved by the *Otawa*, which arrived shortly after the *Takasago* sank.

On December 15 the Japanese torpedo boats again attacked the *Sevastopol*, also the coast defense vessel *Otvazhni* and the torpedo-boat destroyers, losing 3 killed and 3 wounded. It was reported unofficially that the Japanese lost a torpedo boat in these attacks on the *Sevastopol*.

On the night of December 16 the Japanese torpedo boats torpedoed and destroyed a Russian destroyer near the *Sevastopol*.

On the 22d Admiral Togo reported that the *Sevastopol* was so badly damaged that she could not, under the conditions existing in Port Arthur, be repaired. On the same day he reported that he had arranged to withdraw the combined fleet from before Port Arthur, having arranged for a closer watch to prevent ships running the blockade and to watch the remnant of the Russian squadron, consisting of the *Otvazhni* and several torpedo-boat destroyers.

On January 2, 1905, four Russian destroyers, the *Skori*, *Stratni*, *Vlastni*, and *Serditi*, arrived at Chefoo from Port Arthur, and were disarmed. Two others, the *Smirli* and *Boiki*, went to Kiao Chow, where they also were disarmed.

All war vessels remaining in the harbor were blown up by the Russians prior to capitulation. The *Sevastopol* and *Otvazhni* were towed into deep water and sunk.

About March 16, 1905, Admiral Rozhstvenski left Nossi Be and proceeded to Kamranh Bay; passing Singapore April 8 and arriving April 12. The length of his stay at the latter place was made the subject of a diplomatic protest by Japan to the French Government.

On April 22 he left Kamranh Bay with the greater part of his vessels, the remainder sailing on the 25th, and rendezvoused in the vicinity of Saddle Islands, off Shanghai, where he was joined on May 10 by Admiral Nebogatov's division, which had passed Port Said on March 24, and Singapore on May 5. Leaving at Saddle Islands and neighborhood the greater part of the transports and colliers with the converted cruisers *Don*, *Kuban*, *Terek*, *Rion* (*Smolensk*), and *Dneiper* (*Petersburg*), Admiral Rozhstvenski proceeded north with the following:

First battle-ship division: *Kniaz Suvarov* (flying the Admiral's flag), *Emperor Alexander III*, *Borodino*, and *Orel*.

Second battle-ship division: *Oslabya* (flying the flag of Rear-Admiral Felkersham), *Sissoi Veliki*, *Navarin*, and *Admiral Nakhimov*.

Third battle-ship division: *Emperor Nicolas I* (flying the flag of Rear-Admiral Nebogatov), *General-Admiral Apraxin*, *Admiral Seniavin*, and *Admiral Ushakov*.

Cruiser division: *Oleg* (flying the flag of Rear-Admiral Enquist), *Aurora*, *Vladimir Monomach*, *Dmitri Donskoi*.

Light cruiser division; *Svietlana* (flying the flag of Captain Scheine), *Almaz*, *Ural*, *Zhentchug*, and *Izmrud*.

The torpedo boats and destroyers: *Bodri*, *Buni*, *Bravi*, *Bezupreshchni*, *Blestiashchi*, *Bistri*, *Biedovi*, *Grozni*, and *Gromki*.

Transports: *Kamtschatka*, *Anadir*, *Irtish*, and *Korea*.

Sea tugs: *Russ* and *Swir*.

Hospital ships: *Orel* and *Kostroma*.

En route from Saddle Islands to the Sea of Japan the first and second divisions of the Russian fleet formed the starboard column, the third and fourth divisions formed the port column, the vessels of the light cruiser division were used as scouts, the transports, tugs, and hospital ships followed in and in rear of the interval between the columns.

On May 27, while approaching the eastern channel of the Straits of Korea, the Russian fleet detected, at about 7 a. m., off to the right, the *Izumi*; the *Dmitri Donskoi* fired on the *Izumi*, which returned the fire and vanished in the fog.

This vessel was the left wing scout of the inner cordon, consisting of the Third (Vice-Admiral Kataoka's cruiser) Squadron preceded by scouts. The first (battle ship) division, the second (armored cruiser) division, and the fourth (Vice-Admiral Uryu's detachment) division, because of the receipt of a wireless message from one of the advanced scouts, the *Shinano Maru*, at 5 a. m., of the approach and course of the Russian fleet, rendezvoused with the torpedo-boat flotillas, about noon, at a point about 10 miles north of Okinoshima.

At this time the paper organization of the Japanese fleet was as follows:

Commander of fleet and First Squadron, Admiral Togo, with Vice-Admiral Kato as chief of staff. The First Squadron contained the first and third divisions:

The first division, Vice-Admiral Misu, contained the battle-ships *Mikasa*, *Shikishima*, *Fuji*, *Asahi*, and the armored cruisers *Kasuga* and *Nisshin*.

The third division, Vice-Admiral Dewa, contained the protected cruisers *Kasagi*, *Chitose*, *Niitaka*, *Otawa*, and

Tatsuta. It seems to have acted more or less independently of the First Squadron and was called the Dewa Detachment.

The Second Squadron, Vice-Admiral Kamimura, contained the second and fourth divisions:

The second division, Rear-Admiral Shimamura, contained the armored cruisers *Idzumo*, *Adzuma*, *Tokiwa*, *Yakumo*, *Asama*, and *Iwate*.

The fourth division, Vice-Admiral Uryu, contained the protected cruisers *Naniwa*, *Takashio*, *Tsushima*, *Akashi*, and *Chihaya*.

The Third Squadron, Vice-Admiral Kataoka, contained the fifth and sixth divisions:

The fifth division, Rear-Admiral Takeomi, contained the armored cruiser *Chiyoda*, the protected cruisers *Itsukushima*, *Matsushima*, and *Hashidate*, and the coast-defense ship *Chinyen*.

The sixth division, Rear-Admiral Togo, contained the protected cruisers *Izumi*, *Akitsu*, *Suma*, and *Yayeyama*. It seems to have operated more or less independently of the Third Squadron and was called the Togo Detachment.

There was a seventh division, Rear-Admiral Yamada, containing the coast-defense ship *Fusoo*, and the gunboats *Banjo*, *Chiokai*, *Uji*, *Maya*, *Tsukushi*, *Akagi*, and *Sumida*.

There were 21 destroyers divided into five divisions, the division commanders being Captains Fujimoto and Yajima and Commanders Yoshijima, Suzuki, and Hirose.

There were in the neighborhood of 60 torpedo boats, usually in groups of four, whose commanders were Lieutenants Fukuda, Kawase, Fusimota, Otaki, Wakagagashi, Aoyama, Kawada, Seko, Kondo, Matsuoka, Kubo, Ogawa, Sakamoto, Narutomi, Wada, Ibari, and Otaki.

There was also a special squadron, Rear-Admiral Ogura, containing the following auxiliary cruisers that had been called in from the merchant marine: *America Maru*, *Nippon Maru*, *Hongkong Maru*, *Yawata Maru*, *Shinano Maru*, *Ringo Maru*, *Sado Maru*, *Tainan Maru*, *Taichin Maru*, *Daijin Maru*, *Haijo Maru*, *Heijo Maru*, *Manshu Maru*, *Koryo Maru*, and *Kasuga Maru*.

Shortly after 10 a. m. the Russians saw off to the westward Vice-Admiral Dewa's detachment sailing toward the entrance

of the strait as though to intersect the course of the Russian fleet. Shortly after 11 a. m. Felkersham's division opened fire against these vessels, which went about and disappeared in the fog.

At 1.20 p. m. the Russians again saw to port some of the vessels of the Kataoka squadron and Dewa and Togo detachments, now sailing northeast to effect a junction with the main Japanese fleet near Okinoshima.

The Russian fleet had approached the straits in two columns, but at 11.40 a. m. formed into single column, the first battleship division leading and followed by the second and third battleship divisions and then the cruiser division, while to the right were the transports and scouts accompanied by the light cruiser division. At noon the course was changed to north 23° east and the leading division fell off a little to starboard and then held itself in column.

At 1.40 p. m. the Russians sighted the Japanese main fleet. At 2.05 p. m. the leading Japanese vessel turned to port and the first division, followed by the second, advanced obliquely against the head of the Russian column. The Third Squadron and the Dewa and the Togo detachments, which had now reached the Japanese main fleet, steamed south to attack the Russian rear.

The sky was clear, the horizon foggy, a moderately strong breeze was blowing from the southwest, and the sea was sufficiently high to interfere with the maneuvers of the torpedo boats.

At 2.08 p. m. the Russians at 8,500 meters opened fire, which was returned a little later by the Japanese when the range had been reduced to 6,000 meters.

The Russian transports fell off to starboard, leaving the cruisers on their left and the scouts behind them. The head of the Russian column gradually fell off to starboard, thus causing the fleet to maneuver on the arc of a circle within which were the transports and destroyers.

The second Japanese division came on to the arc of the outer circle on which their first division was maneuvering and with it concentrated their fire on the leading Russian vessels and those flying Admirals' flags, using high explosive shells at first and then armor-piercing projectiles.

At 3.10 p. m. the *Oslabya* turned turtle and sank. The greater part of the officers and crew were taken off by destroyers before the vessel sank.

The *Kniaz Suvarov* was unmanageable at this time, and in endeavoring to protect this vessel the other Russian vessels fell into more or less confusion. The Japanese first division had by this time forged ahead of the Russian column, led by the *Borodino*, heading nearly southeast. Thinking the Russian vessels had headed north to pass in rear of the second division, the vessels of the first division turned 16 points to the left and steamed nearly northwest, the *Nisshin* leading. The second division also went about and followed the first division.

Up to this time the most important damage to the Japanese fleet had been inflicted on the *Asama*, which was compelled to leave the line of battle by injuries to the steering gear and the entrance of water. After effecting temporary repairs the *Asama* rejoined the firing line.

The *Shiranui*, of the Hirose flotilla, and the *Asahiwo*, of the Suzuki flotilla, were both severely injured while attempting to torpedo the *Kniaz Suvarov* at about 3.40 and 4.55 p. m., respectively, but were saved from sinking. One of the torpedoes discharged in the latter attack struck the *Suvarov* on the port side near the stern, causing a list of about 10°.

The *Suvarov* was, however, in a helpless condition before this attack. Admiral Rozhstvenski, wounded, and some of the members of his staff were transferred about 3.30 p. m. to the *Buini*, one of the boats which had received the crew of the *Oslabya*. The command of the fleet was then transferred to Vice-Admiral Nebogatov.

At about 4.40 p. m., having again gone about and while steaming nearly southeast, the Japanese first and second divisions lost sight of the Russian armored vessels and steamed south, the second division leading, firing on special service vessels and scouts. At 5.30 p. m. the first division went about and steamed north, while the second division steamed to the southwest and took part in the action against the Russian cruiser squadrons and service ships.

About 5.40 p. m. the first division sank the *Ural*, continued northward and came into action against six of the Russian armor clads steaming to the northeast. The first division,

steaming parallel to and faster than these vessels, caused the latter to gradually turn to the north and then to the north-west, and nearly west, the *Borodino* leading.

To the left of the Russian armor clads were the *Oleg*, *Aurora*, *Dmitri Donskoi*, and *Vladimir Monomach*; to the left of these were the remaining transports escorted by the *Sviatana* and *Almaz*; the destroyers, the *Zhentchug*, and the *Izumrud* were still farther to the left.

About 7.20 p. m. the *Borodino*, on which a serious fire had broken out, settled to starboard and sank, apparently from the explosion of the magazine. About the same time the *Alexander III*, which had been compelled to leave the line of battle some time before, also sank.

At sunset, about 7.35 p. m., the Japanese first division drew off to the east to allow the torpedo-boat flotillas, which were approaching from three sides, to attack during the night.

During this time the cruiser squadron and special-service ships of the Russians had been engaged with that portion of the Japanese fleet which had steamed south on receipt of the battle orders at 2 p. m. The Dewa and the Uryu detachments, keeping in touch, at 2.45 p. m. opened fire against the Russian cruiser squadron while steaming parallel to and in the opposite direction, made a detour across the rear and steamed parallel to and in the same direction as the Russian vessels. This maneuver was repeated several times.

About 4.20 p. m. the Uryu detachment sank the *Irtish* and a little later disabled the *Kamtchatka*. At about this time the Third Squadron joined the Dewa and the Uryu detachments in the attack.

At 4.40 p. m. four Russian armor clads joined from the north with the cruiser squadron and with it inflicted considerable damage on the Japanese vessels.

Vice-Admiral Dewa had at that time transferred to Vice-Admiral Uryu all his vessels except the *Kasagi* and the *Chitose*, and with these two vessels ran into the quiet waters of Aburadani Bay. Vice-Admiral Dewa came out the same evening on the *Chitose*, but the *Kasagi* was too badly damaged to take any part in the fighting on the next day.

At 5.10 p. m. the *Naniwa*, flagship of the Uryu detachment, was hit below the water line and compelled to retire for repairs.

At 5.30 p. m. the Japanese second division joined in this attack on the Russian cruiser squadron and four armor clads which had joined at 4.40 p. m.

During this fighting the Dewa and Uryu detachments concentrated their fire principally on the transports, the *Svietlana*, the *Almaz*, and the *Ural*. The crew of the *Ural* was by order from the *Svietlana* transferred to the *Korea* prior to the sinking of the *Ural* by the first division at 5.40 p. m.

The *Svietlana*, struck below the water line, fell out of the line but subsequently regained her place. The *Dmitri Donskoi* and *Vladimir Monomach* several times left the line to protect the transports.

As the cruiser squadron continued to give way it uncovered the *Kniaz Suvarov* and the repair ship *Kamchatka*, both disabled. The Togo detachment sank the *Kamchatka* at 7.10 p. m., and the Fujimoto destroyer flotilla twice torpedoed the *Suvarov*, which sank at 7.20 p. m.

About this time the Japanese squadrons and detachments received the wireless message from the *Tatsuta* giving Admiral Togo's order to assemble at Ullondo Island, and steamed away to the northeast.

At the time of withdrawal of the various Japanese squadrons the course of the Russian fleet was north 23° west. The various Japanese torpedo-boat flotillas which had rendezvoused in Miura Bay (Tsushima) prior to the engagement, taking shelter from the high sea, attacked the Russian vessels at 8.15 p. m., the Fujimoto destroyer flotilla against the head of the armor-clad column from the north, the Yajima destroyer flotilla and the Kawase torpedo-boat flotilla from the northeast, the Yoshijima destroyer flotilla against the rear from the east, the Hirose (Juntaro) destroyer flotilla from the southeast. The torpedo-boat flotillas under Fukuda, Otaki, Kondo, Aoyama, and Kawada pursued from the south both the armor-clad column and the cruisers steaming parallel with and to the left rear of the armor clads.

On the approach of the flotillas the Russian armor clads turned 8 points to port, so as to lessen the distance separating them from the cruisers. The latter also turned to port and the *Oleg*, *Aurora*, and *Zhemtchug* continued to the south, while the others, with the armor clads, again turned to port and proceeded in an eastern direction.

The fire of the flotillas was aided by the fact that their approach compelled the Russian vessels to use their searchlights, thus betraying their location and facilitating the use of the searchlights of the flotillas.

The *Sissoi Veliki*, *Admiral Nakhimov*, and *Vladimir Monomach* were torpedoed and rendered helpless. On the side of the Japanese, torpedo boat No. 69 (commander's boat) of the Fukuda flotilla, No. 34 (commander's boat) of the Aoyama flotilla, and No. 35 of the Kawada flotilla, were sunk by gun fire; their crews were saved by their companion boats, the *Karigane*, No. 31, No. 62, and others. The destroyers *Harusame*, *Akatsuki*, *Ikazuchi*, and *Yugiri* and torpedo boats *Sagi*, Nos. 33 and 68 were so badly damaged by gun fire and collisions that they were temporarily compelled to withdraw from the fight.

At 2 a. m. on the 28th the Suzuki flotilla torpedoed and sank the *Navarin*.

At dawn on the 28th the Japanese first and second divisions were about 20 miles south of Ullondo Island when the Third Squadron, from a point about 60 miles farther south, reported the presence of Russian ships to the east. These ships proved to be the battle ships *Orel* and *Emperor Nicolas I*, the coast-defense ships *General-Admiral Apraxin* and *Admiral Seniavin*, and the cruiser *Izumrud*, Admiral Nebogatov commanding. The first and second divisions approached from the west; the Third Squadron and the Uryu detachment approached from the south. At 10.30 a. m. the Russian vessels were surrounded at a point 8 miles south of Takeshima (Liancourt Rocks). The *Izumrud* escaped; the others surrendered. The *Orel* was taken to Maizuru, the *Nicolas I*, *Apraxin*, and *Seniavin* to Sasebo. The four vessels in the order given were renamed *Iwami*, *Iki*, *Okinoshima*, and *Minoshima*.

The *Izumrud*, after escaping, proceeded north, and at 1.30 a. m. on May 30, while entering Vladimir Bay, ran on a reef, where she was blown up by her commander, Captain Versen, after the crew had landed.

At 7 a. m., while proceeding northward, the Uryu detachment discovered the *Svietlana* and the destroyer *Bistri* off to the west. A section containing the *Otawa* and *Nitaka*, under command of Captain Arima, was sent in pursuit and an engagement ensued, lasting about one hour. At 11.06 a. m.

the *Svietlana* sank off Chekuryon Bay. The *Nitaka*, in cooperation with the destroyer *Murakumo*, continued in pursuit of the *Bistri*, which ran aground and was destroyed in a small bay about 5 miles north of Chekuryon Bay.

The survivors from the two Russian vessels were taken on board the Japanese special service ships *America Maru* and *Kasuga Maru*.

The Japanese destroyer *Shiranui* and the special service ship *Sado Maru*, at a point about 5 miles east of Kotosaki, Tsushima, discovered the *Admiral Nakhimov* at 5.30 a. m. on May 28, and a little later the *Vladimir Monomach*, both in a sinking condition. After the crews had been removed the vessels sank, about 10 a. m.

The *Gromki* appeared in this neighborhood, was pursued by the *Shiranui* and torpedo boat No. 63, and captured off Ulsan in a sinking condition at 11.30 a. m. She sank at 12.43 p. m., the crew having been previously removed.

The special-service ships *Shinano Maru*, *Tainan Maru*, and *Yawata Maru*, at a point about 30 miles northeast of Karasaki, Tsushima, discovered the *Sissoi Veliki* in a sinking condition. The vessel sank at 11.05 a. m., the survivors being rescued.

The *Admiral Ushakov* was pursued from near the place of Admiral Nebogatov's surrender by the *Iwate* and *Yakumo* and sunk a little after 5 p. m.; about 300 survivors were rescued.

The *Dmitri Donskoi*, steaming north, was discovered and followed by the Uryu detachment at 5 p. m. She was headed at a point some 30 miles south of Ullondo Island at 7 p. m. by the *Otawa*, the *Nitaka*, and the destroyers *Asagiri*, *Shirakumo*, and *Fubuki*. The firing continued until dark, when the destroyers attacked. Although seriously damaged, the *Dmitri Donskoi* escaped from her pursuers. Toward morning of the 29th her crew was landed on Ullondo Island and the vessel sunk by opening the Kingston valves. The survivors were taken on board the *Kasuga* and *Fubuki*.

The *Buini*, after having transferred Admiral Rozhdestvenski and staff to the *Biedovi*, and about 200 survivors of the *Oslabya* to the *Dmitri Donskoi*, sank.

The *Biedovi*, with Admiral Rozhdestvenski and staff, was captured by the destroyers *Sazanami* and *Kagero* about 40 miles southwest of Ullondo Island about 4.45 p. m.

Of the remaining Russian torpedo boats the *Grozni* reached Vladivostok on May 29, the *Bravi* on the 31st. The *Bodri* and *Blestiashchi* escaped south in company. About 5 a. m. May 28, the crew of the *Blestiashchi*, which was no longer manageable, was transferred to the *Bodri* and the former vessel sunk by opening the Kingston valves. The *Bodri*, after exhausting her water and fuel, was picked up in latitude $32^{\circ} 22' N.$, longitude $112^{\circ} 42' E.$, by the British merchant vessel *Kueling* and towed into Wusung, where she was interned. The *Bezupreshchni* was missing.

The *Aurora*, *Oleg*, and *Zhemtchug*, Rear Admiral Enquist commanding, arrived on June 3 at Manila, where they were interned.

The *Almaz* reached Vladivostok on May 29.

The transport *Korea* and the sea tug *Swir* reached Wusung on May 30, and were interned, as were six other transports that had gone into that port from the vicinity of Saddle Islands.

The *Anadir* escaped and on June 28 arrived at Diego Suarez with a portion of the survivors of the *Ural*.

The *Kostroma* and *Orel* were taken to Sasebo by the Japanese on suspicion of violation of some of the provisions of The Hague Conference. The first was afterwards released, the second was confiscated.

The Russian casualties were 191 officers and 4,500 men killed and wounded and 6,143 captured.

The Japanese reported their total casualties for this engagement as 116 officers and men killed, 538 wounded; their total naval casualties for the war, 221 officers and 1,782 men killed, 170 officers and 1,497 men wounded, making a total of 2,003 killed and 1,667 wounded.

Early in June the *Dneiper* (*Petersburg*) transferred to the Dutch steamer *Flores* in the Straits of Malacca 41 of the Chinese crew and the mails of the British steamer *S. Kilda*, captured by the *Dneiper* with contraband on board in the China Sea on June 4 and sunk the next day. The European officers of the ship were retained by the *Dneiper*.

On June 5 the *Terek* sank the British vessel *Ikhona* about 150 miles north of Hongkong, transferring the crew to the Dutch vessel *Perlak*.

On June 22 the *Terck* similarly sank the Danish vessel *Princess Marie*. A few days later the *Terck* was disarmed and interned at Batavia.

On May 30 the *Don* sank the German steamer *Tetartos* in the North China Sea on the charge of carrying contraband, consisting of railroad timber and sleepers. The crew of the *Tetartos* was landed at Batavia.

OPERATIONS IN KOREA AND SAKHALIN.

In Korea the Japanese, early in 1905, began the concentration of the Sixth Army under General Hasegawa. The principal forces landed at Gensan and operated north along the coast in the direction of and against the Russian Vladivostok army under General Kasbeck, that had sent expeditions into and occupied northern Korea.

By June the advance of General Hasegawa was in contact with the Russian forces and several engagements of greater or less severity, none of which reached a magnitude to merit the designation of battle, occurred. On July 24 the Japanese dislodged the Russians from and occupied Puryang and Puku. The advent of the rainy season and the sessions of the peace conference at Portsmouth suspended serious operations on the part of these two opposing armies.

On July 7 another Japanese force landed near Korsakovsk, capital of Sakhalin, and occupied the town, the Russian garrison withdrawing after having blown up the coast-defense guns and burned the government buildings. General Hareguchi commanded the Japanese forces operating in this region; General Liapunov commanded the Russian troops.

With the aid of the fleet and transports, the Japanese proceeded to various points on the island, overpowered the small Russian garrisons, and occupied the important villages without any very serious engagements. The bulk of the Russian garrison, 70 officers and 3,200 men, surrendered July 31. The final skirmish did not take place until September 1, 1905, but four days before the treaty of peace was signed.

PORTSMOUTH CONFERENCE.

On the initiative of President Roosevelt, plenipotentiaries were appointed by the two nations, Baron Komuro and Mr. Takahira by Japan, Count Witte and Baron Rosen by Russia, to meet and discuss terms of peace.

The conference assembled at Portsmouth, N. H., August 29. The treaty was signed September 5 and ratifications were exchanged November 25, 1905.

By the terms of the treaty Russia recognized the paramount interest of Japan in Korea, transferred to Japan the Chinese East Siberian Railway south of Changchun (Kuanchengtzu), that part of Sakhalin south of fiftieth parallel, and the Russian Liaotung lease, covering an area of about 500 square miles, containing Port Arthur and Dairen (Tairen). Japanese subjects were granted certain fishing privileges along the Siberian littoral. Manchuria was returned to China, and the troops of Russia and Japan, in excess of 15 men per kilometer of railway as guards for the same, were to be withdrawn within eighteen months.

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Second (Military Information) Division, General Staff, No. 12

Influence of the Experience of the Siege of Port Arthur upon the Construction of Modern Fortresses

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TRANSLATED FROM THE RUSSIAN
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Influence of the Experience of the Siege of Port Arthur upon the Construction of Modern Fortresses.

On this line of forts the battles for the defense of the fortress must be fought; here the artillery and infantry must offer a decisive resistance to the enemy.—*Engineering Defense of the Country*, by K. Velichko.

P R E F A C E .

It is the duty of every person to publish all of the valuable information which he has acquired by experience in war.

The great length of the siege of Port Arthur allowed the engineers who were in the fortress to get an insight, under service conditions, into many problems of fortress construction. As one of these engineers, I have decided to give here all the information which I had the opportunity to collect. My notes are undoubtedly incomplete, as it is possible that many things have been overlooked.

I hope that this work, done to the best of my ability, will be useful to those who devote themselves to the study and construction of fortifications.

TRANSLATOR'S NOTE.

In the translation, the Russian designations of the defensive works, where numerals and letters were used, have been retained. Russian names have as far as possible been translated into English. As many of the fortifications and topographical features about Port Arthur are better known under designations applied to them by the Japanese and by military observers and correspondents, the following table has been prepared to connect these features with their several names, and a map of the Kuangtung Peninsula using the more familiar names has been added.

The designations used for the various defensive works enable them to be readily located, as they are numbered and lettered, according to their class, from right to left or counter-clockwise around the fortress. The following classification indicates the nature of the works: Forts (permanent), redoubts (more or less temporary), fortifications, lunettes, caponiers, and batteries (seacoast and land). This classification, based on the project for the fortress, does not always indicate the relative importance of the works at the time of the siege, for, as will be seen, most of the forts, uncompleted at the outbreak of the war, were really only temporary works during the siege, while Redoubt No. 3, called temporary, was in fact as strong as most of the forts. It is generally rated as a fort by other writers.

Some explanation is necessary in regard to the term "caponier" which is extensively used by the author, and has been retained for convenience in the translation. In addition to the usually understood use of the term, as a portion of the main work projecting into the ditch from which a flanking fire on the ditch may be obtained, the author in his discussion of rear (gorge) caponiers, contemplates the use of certain "intermediate rear caponiers" not only to afford flanking fire on the gorge ditches, but also on the intermediate

interval to the next fort. In further extension of this idea of flanking the intervals between forts, he uses the term "caponier" to designate certain intermediate temporary works, constructed for the purpose of supporting the intervals by flanking fire. The word "fortification," for want of a better term, has been used to designate four small numbered redoubts on the main line of defense in order to distinguish them from other redoubts on the main line.

Table of corresponding names of works and features.

Text.	Japanese or other designation.
Fort No. I.....	Pai-yin-shan, Old Fort.
Fort No. II.....	{Tung-chi-kuan-shan, North. North Kee-kuan.
Fort No. III.....	Erlungshan, Urlungshan.
Fort No. IV.....	Itzushan.
Fort No. V.....	Tai-yang-kon, North.
Redoubt No. 1.....	On Twin Peak.
Redoubt No. 2.....	{Tung-chi-kuan-shan, Southeast. Southeast Kee-kuan.
Redoubt No. 3.....	Sung-shu-shan.
Redoubt No. 4.....	Ta-antzu-shan.
Redoubt No. 5.....	Hsitaityangkou.
Takhe Redoubt.....	Southeast Redoubt.
Caponier No. 1.....	Pai-yin-shan, New Fort.
Battery A.....	Pai-yin-shan, North.
Battery B.....	{Tung-chi-kuan-shan, East. East Kee-kuan.
Kuropatkin Lunette.....	Battery Q.
Caponier No. 2.....	Battery P.
Fortification No. 1.....	East Panlungshan.
Fortification No. 2.....	West Panlungshan.
Caponier No. 3.....	Battery G.
Letters Battery.....	Battery R.
Small Eagle Nest.....	Battery M.
Eagle Nest.....	Wangtai, Van tai, Wantai.
Redoubts Battery.....	Battery H.
Wolf Battery.....	Ro. Battery.
Mound Battery.....	Tungshushan Annexed Battery.
Aqueduct Redoubt.....	Fort Kuropatkin.
Idol Redoubt.....	Shui-shih-ying Redoubt.
Battery C.....	Hsiao-an-tzu-shan.
Battery D (Sapper).....	Hsiao-an-tzu-shan.
Division Hill.....	Long Ridge.
Long Hill.....	Namakayama.
Flat Hill.....	Asakayama.
Wolf Ridge.....	Feng-huang-shan.

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CHAPTER I.

PLANS OF MODERN LAND FORTRESSES IN RUSSIA AND ABROAD— FEATURES OF MODERN LAND FORTRESSES.

PLANS OF MODERN LAND FORTRESSES IN RUSSIA AND ABROAD.

The modern land fortress has two separate parts, the enceinte and the periphery. In the center of the protected area is located the defended city surrounded by an enceinte (wall); along the periphery are erected separate fortifications, forts with batteries between them. The forts, the intervals between them, and the batteries form a fighting line, while the enceinte plays the rôle of a reserve, a last position. In the space between the line of forts and the enceinte are magazines and the lines of communication between the fighting line and the city. This is the form adopted by all nations; the fortresses of different nations differing only in the details of the design of the forts, the length of the intervals between them, the disposition of the batteries, etc.

This plan is not the project of an individual, but is a natural and gradual development of the idea embodied in the most ancient fortresses. The design of a fortress depends entirely upon the means of destruction possessed by the enemy. Hence, the degree of civilization of a nation and the spirit of the times play here a most important part. The history of fortification teaches us that in each epoch the defense has endeavored to adopt such a design as would enable the works to withstand the means of destruction of that epoch. We see that the following factors have the greatest influence upon the design of fortresses: (1) The development of artillery; (2) the increase of population and of the size of armies and garrisons; and (3) the advance of civilization, as shown more particularly by the improvement of the means of communication and by various inventions used in the arts of war. Under the influence of these factors the fortresses of the nineteenth century consisted of sepa-

rate works (bastions, etc., for points of support) joined by a rampart, built almost immediately on the confines of the city. Although the idea of placing the works in a more advanced position was advocated more than fifty years ago, an example was necessary to secure its adoption. Sebastopol afforded the example.

After Sebastopol the engineers of all countries endeavored to place around the defended city a line of works at a sufficient distance to protect it from bombardment, the old ramparts being maintained in the old fortresses. In recent fortresses, in addition to the outer works, fortifications of the second line or the so-called central works were erected. This is the type of all large land fortresses in Russia and abroad. The general form being adopted, it is necessary to vary the details to suit the locality.

FEATURES OF MODERN LAND FORTRESSES.

We see that modern fortresses have the following features:

1. The works have the general form of a circle.
2. Forts are scattered along the circumference of this circle.
3. The forts are the points of support on the fighting line.
4. The interval between the forts is from $1\frac{2}{3}$ to $4\frac{2}{3}$ miles.
5. Permanent and temporary batteries, trenches, etc., are placed in the intervals.
6. The foregoing works constitute the fighting line.
7. Along this line and between it and the enceinte run lines of communication consisting of roads and railways.
8. In the center of the circle lies the city.
9. The city is surrounded by an enceinte consisting of a series of points of support with a rampart and a ditch running between them.
10. Powder magazines are placed at various points between the enceinte and the line of forts.
11. Within the enceinte are the main magazines and the depots of supplies.
12. The distance between the forts and the enceinte varies from $\frac{2}{3}$ to 3 miles.

The first feature of this plan, the circle, is the final development of the most ancient type of fortification, the quadrangle. In the evolution of fortification, the polygon succeeded the quadrangle; as itself followed by the circle, the most perfect form. This excludes almost entirely long-range enfilade fire and gives a position without flanks. Flank attacks are thus rendered impossible.

Moreover, forts placed on the arc of a circle afford greater facilities for mutual support than when placed on the straight side of a polygon. The forts are, in fact, points of support so arranged that the intervals between them can not be taken, if the defense be well conducted, until the forts are captured. The distance between these forts, which constitute the artillery and infantry positions of the defense, is determined by the facilities for mutual support.

For quick and convenient communication the outer line is connected by roads and railways with the city, the depots, magazines, and reserves. The outer line must secure the city, situated at the center of the circle, from bombardment. The distance between the outer line and the city is determined by the range of siege guns. At the present time this distance should not be less than 6 miles. To prevent the enemy from swarming into the city on the heels of the defeated garrisons of the outer line, the city is surrounded by an enceinte consisting of a rampart with a ditch and points of support, in rear of which are the main magazines and depots of supplies.

The foregoing plan constitutes, so to speak, the skeleton or framework of the fortress. All the above-described works are erected in time of peace. Upon mobilization, the intervals are furnished with temporary earthworks, batteries for fortress artillery, trenches, etc. The fighting position for artillery and infantry, which does not exist in time of peace, is now prepared.

The following characteristics may be pointed out with reference to the design and preparation of this position by foreign nations:

1. The French propose to establish groups of fortifications in the intervals.
2. The Germans prefer separate permanent fortifications with separate field fortifications alongside of these.

3. Somewhat to the rear of this line and immediately in front of the belt road, the Germans erect in time of peace a row of bombproof quarters for the infantry garrison.

4. Both the French and the Germans erect several permanent batteries in the intervals, the Germans having the so-called fort batteries, i. e., batteries outside of the forts but close to them.

5. The guns in the forts are mounted in turrets.

6. Underground telephones are used for communication.

7. All the plans coincide in the following particulars:

a. The intervals between the forts may be furnished with temporary works during mobilization.

b. The main defense of the intervals is based upon the cross-fire of the forts.

Thus we see that in planning a fortress it is found necessary to secure the city by the erection of an uninterrupted enceinte with points of support. Less attention has been given to the forts on the outer line, and no thought whatever to the preparation of the ground on which the fight will take place. The Germans alone have given these neglected features some consideration, but far less than they deserve.

CHAPTER II.

(See Plates I and XI.)

THE PLAN OF THE FORTRESS OF PORT ARTHUR—THE MAIN LINE OF DEFENSE—ADVANCED WORKS—THE CENTRAL ENCEINTE—COLONEL VELICHKO'S PLAN—GENERAL SCHEME OF THE LAND DEFENSES.

THE PLAN OF THE FORTRESS OF PORT ARTHUR.

Before describing the fortress of Port Arthur we shall speak of it under the following heads: 1, The plan; 2, what had been done before the war; 3, the condition of the fortress during mobilization and during the siege. The third item will undoubtedly be the most interesting, but it is necessary to consider the other two.

One of the persons best acquainted with the history of the fortifications, M. Timchenko-Ruban, in describing the fortress in his book, *A Few Words on Port Arthur*, divides all the works into two parts—the central enceinte and the outer line.

The project of this fortress is presented as follows in his detailed description:

According to the project, the defensive works of Port Arthur were to consist of a row of coast batteries, a line of land fortifications on the advanced heights, and the central enceinte near the old city and surrounding it. The armament of the fortress was to consist of 541 guns and 40 machine guns, 64 of the guns being held in reserve.

THE MAIN LINE OF DEFENSE.

The line of land fortifications, which were to be armed with 237 guns, could be divided into three fronts, the northeast, the north, and the west.

The northeast front, bounded on the right by Fort No. I and on the left by Battery B, was to include one permanent fort (No. I), two redoubts (Nos. 1 and 2) of a lighter type, but of concrete, described in the project as "temporary," two permanent batteries (A and B), one separate open intermediate caponier, one rear fortification (on Great Hill), and three batteries which were to be erected during the period of mobilization. These works, with the exception of the three

batteries, which were to be armed with guns from the reserve, were to be armed with 52 guns and 12 machine guns, distributed as follows: (1) Twenty-eight light field guns and four machine guns to defend the city against assault and to fire in the zone immediately in front; (2) eighteen 6-inch guns (eight of 6,862 pounds and ten of 4,334 pounds) to oppose the investing batteries, and (3) six 57-mm. rapid-fire caponier guns and eight machine guns for the defense of the ditches. On this front were two and one-half companies of infantry in addition to guard troops, battery supports, and local reserves. The length of this front from the flanking fortifications of the adjoining land front to the nearest coast battery was about 3 miles.

Fort No. I was well placed; it covered with its fire the slopes of Siaokushan and Takushan and the approaches to Dragon Ridge and flanked the ravines between these hills. Four 6-inch (6,862 pounds) guns, mounted on coast platforms in this fort, the so-called Round Battery, could fire upon the bay of Takhe.

The caponier was intended to flank the approaches to the works on this front.

The batteries to be erected during mobilization on the heights in rear of the open caponier were intended to cover with their fire the slopes of Siaokushan and the ravine in front of Fort No. 1.

Redoubt No. 1, which was to be erected on Danger Hill, was a rear point of support.

Battery A, armed with six 6-inch guns of 4,334 pounds each, covered with its fire the upper part of the valley of the river Takhe and the summits of Siaokushan and Takushan and flanked the distant approaches to Fort No. II.

Redoubt No. 2, which served to connect Forts No. I and No. II, could not be defended by its own fire on account of the conformation of the ground, but could fire on the approaches to Batteries A and B, which, in their turn, could fire on the approaches to the redoubt. For this purpose it was the intention to increase the armament of Battery A by two light field guns and that of Battery B by four light field guns.

Battery B, armed with four 6-inch guns of 6,862 pounds, as well as the battery which was to be erected during mobilization in its rear, could fire along the front against the approaches to the nearest intermediate works of the northeast and north fronts.

The work on Great Hill to be erected in rear of the northeast front opposite its center was almost secure from assault, owing to the nature of the ground. It could cover the retreat from the first line in the direction of the enceinte.

The main approaches to the northeast front ran along two ravines, plainly marked on the terrain: one on the right between Siaokushan and Takushan; the other on the left extending north of Takushan. All the works proposed in the project were well located for covering these ravines. The fire of twenty-two guns could be concentrated on them, not including the works which were to be erected during mobilization.

The north front, bounded on the right by Fort No. II and on the left by Redoubt No. 3, was to include two permanent forts (Nos. II and III), two works of a lighter type (Eagle Nest and Redoubt No. 3), two temporary fortifications (Nos. 1 and 2), and seven batteries which were to be built during mobilization. Excluding the seven batteries, these works were to mount sixty-two guns, as follows: Thirty-six light field guns to meet infantry attack in front, six 6-inch guns to oppose the investing batteries, and twenty-four 57-millimeter rapid-fire caponier guns to flank the ditches. These works were to be manned by four and one-half companies of infantry in addition to the guard troops, the battery supports, and the local reserves. The length of this front was about $3\frac{1}{2}$ miles.

Fort No. II, which was to be erected on the site of an old Chinese fortification, could fire on the approaches to the right flank and to the center of the north front, the rear approaches to Siaokushan, and the immediate vicinity of the village of Palichjuan.

Eagle Nest on the high hill of Wantai, in rear and to the east of Fort No. II commanded a wide view and had an excellent range for its 6-inch guns, all of the bays being in full view. The two ravines running from Wantai to the south and west could not be covered effectively from this work.

Fortifications Nos. 1 and 2, which were to be erected on the site of old Chinese earthworks, were to connect Forts Nos. II and III. They were necessary on account of the broken ground.

The valley of the River Lun-he was under the fire of a battery of 6-inch guns in Fort No. III. The rear caponier of this work could fire on the approaches to Fort No. II and to Fortifications Nos. 1 and 2, and the region around the village of Shuishiyang. It was the intention to prepare a site for a horse battery on an adjacent hill on account of a large ravine which could not be reached from these works.

Redoubt No. 3 was to serve as a support to Fort No. III in case it were attacked from the Great Mandarin road. This work could fire on the approaches to Forts Nos. III and IV, and the river valleys near the two villages of Sikou.

The seven batteries which were to be erected during mobilization, and armed from the fortress artillery reserve, were to oppose the investing siege batteries.

The opinion was general that the approaches to the north front, and especially to Fort No. III, could not be covered effectively by the fire of the works on this front and that an energetic enemy might break through the line from the direction of the Great Mandarin road. It was thought that these defects could be removed entirely by the erection of Fort P, a strong work, the details of which will be given later.

The west front, bounded on the right by Fort No. IV and on the left by Fortification No. 4, was to include three permanent forts (Nos. IV, V, and VI), two works of a lighter type (Redoubts Nos. 4 and 5), three temporary works (Fortifications Nos. 3 and 4 and a lunette), four permanent batteries (C, D, E, and the "Salt" Battery) and seven

batteries to be erected during mobilization. Excluding the seven batteries, it was the intention to mount 119 guns and 4 machine guns, as follows: Sixty-one light field guns to meet infantry attack in front, thirty 6-inch (twelve of 6,862 pounds and eighteen of 4,334 pounds) to oppose the investing batteries and to fire on Pigeon Bay and the waters between Tiger Peninsula and the coast ridge of Liaotesshan, and twenty-eight 57-millimeter guns and four machine guns to flank the ditches. These works were manned by six companies of infantry in addition to fortress guards, battery supports, and local reserves. The length of the western front was $7\frac{2}{3}$ miles.

Fort No. IV could support effectively the neighboring forts and fire into the river valleys near Sikou, Shuishiyang, and Pach-lunshan. The end faces of this work were near the abrupt slope of a rock 185 feet high and therefore its nearest approaches were to be defended by flanking fire from trenches to be dug along the sides of the fort. Batteries C and D (the Sapper) with ten 6-inch guns in permanent emplacements could fire into the valley of the river Lun-he and upon the approaches to Redoubt No. 3 and to Forts Nos. III and IV. In general, they could flank the approaches to the line of defense to the right and left of these batteries. The site of the Sapper battery was well chosen to attain this end.

Redoubt No. 4, and the adjacent "barbette" battery with eight 6-inch guns of 4,334 pounds, had an excellent field of fire along the front and against the approaches to Fort No. V.

Fort No. V could fire with moderate effect upon the approaches to Fort No. IV and Snipe Hill (site of Redoubt No. 5) and with less effect along their front. Its position would be bad if 203-Meter Hill, which commanded it, were captured. Two strong batteries were to be built during mobilization to support Fort No. V.

Battery E, with six 6-inch guns of 6,862 pounds in permanent emplacements and three batteries to be built during mobilization, marked on the plan between Battery E and Fort No. VI, were to fire into the valley running to Pigeon Bay and to support Forts No. V and No. VI.

Redoubt No. 5, which was to be erected on Snipe Hill, was considered to be very important on account of its position, which closed the break to the Western Basin. The possession of this work would enable the enemy to enfilade our entire western position. Its value to the enemy, the ease with which it could be approached through a wide valley, and the lack of support from other permanent works caused No. 5 to be given strong means of self-defense.

The temporary lunette and Fortification No. 3 were considered as rear points of support closing the approaches to the new city from the west.

Fort No. VI and Fortification No. 4 were to prevent the enemy from breaking through from the direction of Pigeon Bay to Tiger Peninsula. Salt Battery, armed with six 6-inch guns of 6,862 pounds on seacoast platforms, could fire upon the water area in the sector between the ridge of Liaotesshan and Tiger Head, the beach near

the village of Bulantze, Tiger Isthmus, the valley running to Pigeon Bay, and the approaches to Fort No. VI.

The west front was considered weak, even when the plan was being made, on account of the want of mutual support between its component parts and the proximity of commanding heights at short range from its northwestern side. Such were the works of the main line of defense.

ADVANCED WORKS.

The defects of the outer line of land defenses in the plan determined upon by the authorities, brought about the project of strengthening this line, immediately after the change of view on Port Arthur which took place in financial and diplomatic circles, a view so erroneous, as was shown by subsequent events, that it is useless to discuss it. It was decided to strengthen the defenses by occupying Takushan and by erecting a group of works in front of the northwestern angle of the fortress.

A strong point of support was to be erected on the summit of Takushan and also a battery with six light guns. From this point it was possible to fire upon the approaches to the center of our north front and into the entire upper part of the valley of the river Takhe. The main object, however, of occupying Takushan was to prevent the enemy from occupying this height, which was only $1\frac{1}{2}$ miles from our line of defense and which commanded all the adjacent region. However, it was not thought that the occupation of Takushan by the enemy would have decisive results, as its far side was abrupt, almost inaccessible, where even mules and donkeys could not ascend. Guns could not be taken to the summit except singly and by hand and only on the side toward the fortress.

In front of the northwest angle of the fortress two permanent forts (P and D),^a one work of a lighter type on 174-Meter Hill, and two separate batteries in permanent emplacements (F and the Horse Battery) were to be built; also seven batteries were to be erected here during mobilization. The permanent works were to mount sixty-eight guns and four machine guns apportioned as follows: Twenty-four light field guns and four machine guns to meet infantry attack in front, eight 6-inch guns of 6,862 pounds, and ten 4.2-inch guns to fire upon the more distant approaches and landing places, and twenty-six 57-mm. rapid-fire caponion guns to flank the ditches.

Fort P could fire upon the village of Shuishiying and all the approaches to Fort No. III. It thus filled the gap previously mentioned as being a weak point in the center of the north front; for it served to prevent the enemy from breaking through in the direction of the Great Mandarin road. Moreover, communication between

^a These works as such were not built and are not shown on maps. From what follows here and elsewhere it may be inferred that Fort P was to have been at the eastern end of Pachlunshan Ridge, Fort D at the western end of Pachlunshan Ridge, Battery F on Deaths Head Hill, and the Horse Battery on Long Hill.—Tr.

Fort P and the central parts of the fortress was easy on account of the configuration of the ground; retreat from the fort could be considered as secure; and two batteries which were to be built during mobilization to the left of the fort on heights absolutely inaccessible from the front (Fox Hill) would render it impossible for the enemy to occupy Fort P even if it should be evacuated by the defense. Hence the construction of Fort P, strongly provided with means of self-defense, was to begin immediately after the approval of the plan of the fortress, the question of obtaining credit being the main factor in the problem.

Battery F was intended to fire into three valleys extending from its front, one being in front of the battery and the other two to the left.

Fort D was to fire into the entire valley of Pigeon Bay and upon the approaches to Battery F, Redoubt No. 3, and Fort No. V, the main reliance being placed upon a battery of four 6-inch guns which was to be installed within the fort. The great strength of Fort D precluded the possibility of the enemy's occupying 203-Meter Hill which was so vital to the defense of the entire fortress and especially to the defense of the city and harbor.

The work on 174-Meter Hill could fire into Pigeon Bay valley and upon the approaches to Fort D and Battery F. It could also prevent the enemy from occupying 203-Meter Hill.

The Horse Battery was to fire into the ravine below Battery F and the village of Tatungkon, while the batteries to be erected during mobilization were to oppose the investing batteries.

THE CENTRAL ENCEINTE.

The enceinte, which was to be built around the Old City, was to consist of a continuous line of parapets and ditches. Along this line, especially at the salient angles, several lunettes and four redoubts were to be erected. The armament was to consist of four 4.2-inch and twenty-four light field guns in the redoubts, and twenty-four machine guns which were to be placed elsewhere along the line intended especially for the flank defense of the ditches. The total length of the enceinte was to be $4\frac{3}{4}$ miles.

The enceinte, as has been stated, was to secure the vital parts of the nucleus against attacks of the enemy, who might break through into the interior of the fortress after the fall of the forts of the outer line, such attacks being made by detachments sacrificed by the enemy in order to destroy the supplies of the fortress and the depot of the fleet before the reserves could be concentrated against them. The enceinte was never considered as a citadel for the garrison in which it could oppose the attack after the fall of the forts. This was precluded by the commanding heights in front, from which even the banquettes of the enceinte could be seen. Especially was this the case from Great Hill and Danger Hill and the position in the vicinity of the left flank of Obelisk Hill, the occupation of which by the

enemy would allow him to bring a flanking and, in some cases, a reverse fire against the left half of the enceinte.

In conclusion we shall add that the batteries to be erected during mobilization were to be armed with guns from the fortress artillery reserve, consisting of sixteen 4.2-inch guns and 6-inch guns of 6,862 pounds, twenty-four light guns, and twenty-four 6-inch field mortars, and also from guns left over after the rearmament of the field artillery of the Kuangtung detachment.

The defense of Port Arthur was thus to depend upon the construction of 22 permanent seacoast batteries,^a 8 permanent forts, 9 permanent land batteries, 9 semipermanent redoubts, 9 temporary works (including the 4 redoubts of the enceinte), 24 batteries to be constructed during mobilization, and about 4 miles of continuous enceinte. Port Arthur might have been transformed into a fortress of great passive strength by the construction of these fortifications, but by a methodical construction only, which should have lasted five years, and for which sufficient and regularly allotted sums should have been forthcoming.

COLONEL VELICHKO'S PLAN.

According to the opinion of Colonel Velichko, who was sent to Port Arthur in 1899 to revise and improve the plan for its fortification, the terrain influenced the strength and character of the works in a manner almost unprecedented. "Such relief, such peculiarities of soil and terrain, had never been encountered around any of our fortresses. The extreme irregularity of the ground, the rows of isolated conical peaks dividing a number of ridges with abrupt sides, compelled us to erect a great number of works in order to obtain cross fire and mutual support and visibility. Moreover, a great number of deep ravines intersecting the positions made additional batteries, intrenchments, and caponiers necessary. The impossibility of developing a sufficiently strong frontal fire (the zones of fire being small on account of many dead spaces formed by the steep sides of ridges) rendered it necessary to provide many flank defenses and, in places, a second line of defense. As the greater part of the slopes could not be covered by the fire of the works on their summits, skirmishers had to be advanced to the military crest in front of the forts, which thus served as keeps. The configuration of the ground made it possible to place the so-called intermediate batteries some-

^aAs may be seen later, the author is mistaken. There were to be 25 seacoast batteries. (See p. 22.)

what in rear of the main line of works, either openly or masked, on ridges and summits commanding the first line. The terrain, the size of the gun platforms, and the rocky nature of the soil had a great influence upon the distribution of the armament.

Thus the main line of defense consisted of a line of trenches, a line of forts or points of support, and a line of intermediate batteries.^a

According to the plan of Colonel Velichko,^b approved by the minister of war, the coast defenses of Port Arthur were to consist of twenty-five seacoast batteries armed with one hundred and forty guns.

(a) Salt Battery on Salt Mountain covered the waters within the sector between Liaotesan and Tigers Head, and the beach near the village of Buladze and Tiger Isthmus. With guns having an all-around fire it was possible also to cover Pigeon Bay, the valley of Sia-dze-goü, the approaches to Fort No. V, the ravine on the right of Fort No. VI, and the approaches to the left of Fort No. V. Being both a sea-coast and a land battery it formed a link between the coast and the land defenses.

(b) Battery No. 1 (B No. 1 on map), under Tiger Head, was to prevent landings on Tiger Isthmus and flank the approaches to the intrenchments crowning the end of Tiger Peninsula.

(c) Battery No. 2 (Tiger Head Battery), with guns having an all-around fire, covered the inner part of the western basin and Pigeon Bay and supported the land batteries of the left flank of the fortress.

(d) Battery No. 3 (Rapid-Fire Terrace Battery) covered the beach of Tiger Isthmus.

(e) Battery No. 4 (West Tiger Battery) covered the east coast of Liaotesan.

(f) Battery No. 5 (Middle Tiger Battery), with guns having an all-around fire, covered Pigeon Bay and supported the left flank of the land defenses.

(g) Batteries Nos. 6 and 7 (Great Tiger Batteries) covered the sea, the inner roadstead, Pigeon Bay, and the entire left flank of the land defenses.

^a Report of Colonel Velichko.

^b Now major-general (1907).

(*h*) Battery No. 8 (East Tiger Battery) covered the extreme left sector adjacent to Flat Cape.

(*i*) Battery No. 9 (Long Range Battery) had an excellent field of fire from Electric Cliff through 130° to the right.

(*j*) Battery No. 10 (Artillery B on map), with guns having an all-around fire, covered the water in the sector between the village of Tsuntzatun and the base of Golden Hill, the inner basins, and the estuary of the Lambe.

(*k*) Battery No. 11 (Southern Quail Battery, on Quail Hill), with guns having an all-around fire, covered the base of Golden Hill, the entrance, and the western basin, the rear slopes of the ridges on the left flank, the southwestern and southeastern slopes of Great Hill and Danger Hill, the valley of the river Tauchen, the rear slopes of Dragon Ridge, and the greater part of the enceinte.

(*l*) Battery No. 12 (Artillery Town Battery) was for use against small vessels, torpedo boats, etc., which might attempt to break into the basin.

(*m*) Battery No. 13 (Golden Hill Battery), with guns having an all-around fire, covered the sea south of the battery, part of the western basin, and the rear slopes of the land defenses.

(*n*) Battery No. 14 (Foot of Golden Hill Battery) covered the waters near the entrance.

(*o*) Battery No. 15 (Electric Battery) covered the dead space in front of the batteries on Tiger Peninsula.

(*p*) Battery No. 16 (Camp Battery) covered the sea in the sector between Southern Cross and Electric Cliff.

(*q*) Battery No. 17 (Rifles Battery) on the summit of Two-horn Hill covered the sea to the right of Southern Cross.

(*r*) Battery No. 18 (Flat Cape Battery) was for service against torpedo boats seeking to enter the basin and commanded the beach to Electric Cliff.

(*s*) Battery No. 19 (Northern Cross Battery) in the depression between the second and third summits north of Western Cross Hill, with guns having an all-around fire, covered Takhe Bay, the Flat Cape Batteries, and the batteries in its rear.

(*t*) Battery No. 20 (Western Cross Battery) near the western slope of Central Cross Hill covered the sector between the Southern Cross and the Electric Cliff Batteries.

(*u*) Battery Long (Middle Cross Battery) covered Takhe Bay and part of the terrain in front of Battery No. 20.

(*v*) Battery No. 21 (Southern Cross Battery) covered Takhe Bay and part of the sea in front of it.

(*w*) Battery No. 22 covered the valley east of Cross Hill and the landing at Miaotun.

(*y*) Round Battery situated within Fort No. 1, like Salt Battery, served as a link between the seacoast and land defenses. It was on a hill 280 feet in height and covered Takhe Bay, the slopes of Siaokushan and Takushan, and flanked the valley of the river Takhe and the approaches to Dragon Ridge.

These two batteries are not given on the plan of the fortress of Port Arthur which was approved by the Emperor.^a

The line of land defenses of the fortress, according to the plan of Colonel Velichko, was to consist of 6 permanent forts, 7 temporary redoubts, 1 intermediate battery, 4 fortifications, and 4 batteries in permanent emplacements.

(*a*) Fort No. I, a permanent work on a rocky spur of Dragon Ridge 420 feet high, for a garrison of one company.

(*b*) A permanent emplacement for 4 light guns for flank defense, in the form of an open caponier, one-third mile north of Fort No. I.

(*c*) Redoubt No. 1, for one-half company, elevation 569 feet, temporary, on Danger Hill, a spur extending out perpendicularly from Danger Ridge. This work was to be a rear point of support.

(*d*) Permanent Battery A was to cover with its fire the Takhe Valley and the summits of Takushan and Siaokushan and to flank the approaches to Fort No. II.

(*e*) Redoubt No. 2, for one company, formed a link between Forts Nos. I and II.

(*f*) Permanent Battery B covered the approaches to the nearest works, and the slopes of Tsiaoshan, Takushan, and Siaokushan.

^a In addition to the twenty-five coast batteries there were to be two stations for firing Whitehead torpedoes for the defense of the entrance.

(g) Fort No. II, permanent, for one company, on a salient hill 385 feet in height about 4,200 feet north of Redoubt No. 2. It had an excellent field of fire against the approaches to the right and center of the northern section of the defensive line.

(h) Eagle Nest (Wangtai), a temporary work on a peak 616 feet high. It had an all-around fire, and from it all of the bays were visible.

(i) Fortification No. 1, a temporary fieldwork for one company and 4 light guns, served to connect Forts Nos. II and III.

(j) Fortification No. 2 was of the same size and character as Fortification No. 1 and served the same purpose.

(k) Fort No. III, a permanent work for one company, 5,600 feet from Fort No. II, closed the valley of the Lunhe to the enemy.

(l) Redoubt No. 3, a temporary work for one company, on a spur of Dragon Ridge 350 feet in height and 2,100 feet from Fort No. III, commanded the Lunhe Valley and served as a support to Fort No. III against attack from the Great Mandarin road.

(m) Fort No. IV, a permanent work for one company, on Caponier Hill, elevation about 490 feet, covered with its fire Pachlunshan and the valleys of Tsirgöü (Hsikon) and Lunhe and gave excellent support to the neighboring works. Two permanent batteries were erected under cover of this fort.

(n) Battery C, on Tooth Hill, elevation 560 feet, covered the Lunhe Valley, and the approaches to Redoubt No. 3, and Forts Nos. III and IV.

(o) Battery D (Sapper Battery), on the left of Battery C, covered the approaches on both flanks of Fort No. IV.

(p) Redoubt No. 4, a temporary work for one company, covered very effectually the approaches to Fort No. V and closed the exit from the Shibantoü Valley to the western basin. This work, now a part of the outer line, will become a point of support in the enceinte when the new city is extended.

(q) Fort No. V, a permanent work for one company, on the summit of Hawks Hill near Yanshigöü. It was the

key to the west front and would support a row of batteries which were to be erected on the left to cover the entire valley and Pigeon Bay.

(*r*) Battery E, the only permanent work among those mentioned in the preceding paragraph which were to be erected to cover Pigeon Bay.

(*s*) Redoubt No. 5, a temporary work on Snipe Hill, was intended as a strong support to the neighboring works and to prevent the enemy from breaking through to the western basin near the salt factory.

(*t*) Fortification No. 3, for one company and four guns, formed the left of the position on Hawks Hill.

(*u*) Fort No. VI, a permanent work for one company $2\frac{2}{3}$ miles to the left of Fort No. V. It was the last fort on this flank of the line and was intended to prevent the enemy from breaking through to Tiger Peninsula.

(*v*) Fortification No. 4, on White Wolf Hill, was to close Tiger Isthmus in case of a landing in the Liaotesan district or a turning movement by the Liaotesan Mountains.

(*w*) A temporary work on Great Hill in rear of the first line, for a half company and six light guns. The commanding positions of Great Hill and Danger Hill gave them great importance in the defense of the northeast and east sections.

In addition to the above mentioned forts, redoubts, and batteries, a series of intermediate batteries was to be erected.

The following works were to be constructed later according to the accepted plan:

1. Two permanent forts, one on Pachlunshan, Fort P, and the other to the east of the village of Tatunkou, near 174-Meter Hill, Fort D.
2. A temporary work, Angle Redoubt, on 174-Meter Hill (Angle Hill).
3. A permanent battery (F) on the northwest summit of Yaoshan above the Tsirho Valley.
4. An advanced work of a temporary type on Takushan.

This group of fortifications, being in touch with the main line, was to prevent the investment of the northwestern side of the fortress. As it was only 2 miles from Louisa Bay and had an excellent field of fire over the valley of this bay, it rendered a flanking movement from the north against the left of the fortress impossible.

The nucleus of the fortress was to be defended against open attack by an uninterrupted enceinte, consisting of 4 redoubts on the most important and commanding points, connected by a sort of *cremaillère*, partly bastioned and partly polygonal, with ditches steeply counterscarped and a *glacis*. Part of the line was provided with head cover.

"Everything in the line of construction," says Colonel Velichko in his report, "must be completed in time of peace, not only forts, but temporary redoubts, fortifications, batteries, infantry entrenchments, and obstacles."

GENERAL SCHEME OF THE LAND DEFENSES.

Leaving aside the part of the project referring to sea-coast defense, let us examine the front of the land defenses in a general way.

The line of forts followed pretty closely the arc of a circle, described around the port as a center, with a radius of $2\frac{1}{3}$ miles, the end forts, Nos. 1 and 6, being 3 miles from the center. In front of this line there were permanent works on Takushan, Pachlunshan, 203-Meter Hill, and 174-Meter Hill at distances of $3\frac{1}{3}$, 4, 5, and $4\frac{2}{3}$ miles from the center.

The enceinte enclosed the old city, running along its outskirts at a distance varying from $\frac{2}{3}$ to $1\frac{2}{3}$ miles from its center. According to the author of the project, it was to serve only against sudden attack and not as a citadel for the defense.

The distance between the forts on the main line varied from $1\frac{1}{3}$ to $2\frac{2}{3}$ miles. The gorges of Redoubts Nos. 2 and 3 were joined by a parapet, which had been constructed by the Chinese. It was known during the siege as the Chinese wall.

The selection of the main line at such a short distance from the city was determined by the size of the garrison and by the lack of a good position at a more suitable distance. Colonel Velichko was well aware that this line would not secure the city against bombardment, but the occupation of the hills in front of the line would go far toward remedying this defect. The possession of these points would render the attack of the city very difficult and would force the enemy to place his siege batteries farther out, thus safeguarding.

in a great measure, the city from bombardment. Hence the works in front of the line were to be strongly fortified.

The only thing which was not foreseen in the project was the necessity of fortifying Liaotesshan. The great importance of this ridge as a flanking position covering the left was clearly shown during the siege of the west front. The project, therefore, as a whole was rational, if we take into consideration the official information on the numbers and armament of the Japanese army, which served as its basis.

Unfortunately a few circumstances prevented the complete execution of the plan.^a As a result, when war broke out, the following works only were ready, namely, the enceinte, one fort, one redoubt, and three permanent batteries. Of the remaining five forts, three were finished in the rough, the fourth was just begun, and the fifth was traced. None of the advanced points were fortified.

The Japanese invested the fortress with means of attack far in excess of that which our ministry of war had given them credit for possessing and which had, of necessity, formed the basis of our plan of defense. Thus, in addition to the ordinary 6-inch guns, the besieging army was supplied with 6-inch and 8-inch howitzers, 11-inch mortars, and 6-inch naval guns with a range of 8 miles. When the siege began it was recognized that a distance varying from $4\frac{2}{3}$ to 5 miles from the forts to the city was insufficient, as the Japanese, having established their 6-inch naval gun battery at a distance of 1 mile from 174-Meter Hill (5 miles from the center) could bombard not only the city, but even the port. The fact that the walls of the fortress casemates were penetrated by 11-inch mortar projectiles shows the necessity in computing the thickness of walls to consider the largest projectile in existence and of using a factor of safety so as to give a reserve of resistance, computing, for example, not for two hits but for three.

^a The aim of this work does not allow us to give these reasons here. In view of the great interest connected with them, they will be given a large space in a work, "The Defense of Port Arthur," which I have undertaken in collaboration with Captain Romanovski, of the Great General Staff.

CHAPTER III.

(See Plates I and VII.)

CONDITION OF THE FORTRESS AT THE BEGINNING OF THE WAR—ENGINEERING WORK DONE DURING MOBILIZATION—NECESSITY FOR PLAN OF ACTION IN CASE OF UNEXPECTED MOBILIZATION—MILITARY ROADS—CONDITION OF THE FORTRESS AT THE BEGINNING OF THE INVESTMENT—ARMAMENTS AND FORCES OF THE BELLIGERENTS—COMMENTS—LABOR AND TRANSPORTATION EMPLOYED DURING MOBILIZATION.

At the beginning of the war the land front of the fortress was in the following condition: On the right flank Fort No. I was unfinished. In the interior of this work was a round concrete emplacement for four 6-inch guns. The fort was on the summit of a hill and had a bastion-shaped face. Its central part, the curtain, was not built, and the glacis was not graded. To the left of the fort and a little to the front of it was an open caponier (No. 1), intended to cover the approaches to the fort and to Battery A, situated to the left of the caponier. In rear of Battery A, on the nearest height, was an old Chinese work called "Redoubt No. 2." The old Chinese wall, already half destroyed, joined this work to Battery B, which had four 6-inch guns. From Battery B the Chinese wall was divided into two parts. One ran along the summit of an advanced ridge and formed the so-called "Kuropatkin Lunette" and joined Fort No. II, while the other ran along the foot of Eagle Nest in the direction of Fort No. III.

Much work had been done on Fort No. II, but the parapets and the glacis were not graded; the second story of the two-storied casemates were not floored; the entrances were not protected by gratings; there were no stairways, and the outer walls were not covered with earth; the counterscarp gallery was unfinished; and there was no covered passage between this gallery and the casemates. In the interval between Fort No. II and Fort No. III were old Chinese fortifications consisting of high parapets without ditches. One of these works near Fort No. III was named Fortification No. 2; another, quadrangular in shape, near

Fort No. II, was named Fortification No. 1. From Fortification No. 2 a section of the Chinese wall ran along the ridge which extended from Small Eagle Nest to Fort No. III.

Fort No. III (see Pl. VII) was only half finished. It had a deep outer ditch, cut in the rock. The flanking ditches, which were tolerably deep at the front angles, became gradually shallow toward the gorge angles, where the depth was between 2 and 5 feet. The ramparts, formed of material taken out of the ditches, was a mass of irregularly shaped stones. In the fort there were permanent emplacements for four 6-inch guns. In rear of these emplacements, under the ramparts closing the gorge, were concrete casemates for the garrison. Close to these casemates was a gorge caponier for the support of the intervals.

Owing to a defect in the plan, this caponier could fire on the right against the approaches to the Chinese wall, but not against the approaches to Fortification No. 2. The gorge ditch on the right was cut in the rock. On the left this ditch ran through a fill made of earth. Both angles were likewise made of earth. The slopes were unrevetted and were constantly crumbling away. Part of the earth was thrown on the glacis, thus increasing the dead space in the vicinity of the fort. Flanking casemates were constructed in the angles of the ditch. The casemate in the right angle was connected by a covered passage with the shelter for the counter-assault guns in the interior of the fort somewhat in rear of the outer breastworks. The other casemate had no covered communication with the fort. The only means of communication possible was along the bottom of a ditch on the left.

Fort No. III was connected by the Chinese wall with the gorge of Redoubt No. 3, from which it was separated by a deep ravine with steep sides, in some places almost perpendicular. This work was in the following condition: The casemates were finished; the ditch, whose bottom was to be stepped, was unfinished; there were no breastworks, and no glacis; and for hundreds of feet around the work there were piles of stones and earth which formed a vast dead space in front of the work. The last section of the Chinese wall ran from the left angle of this work across the Kurgan Hill and descended along its military crest to the railway line.

The enceinte along the outskirts of the city was parallel to the outer line of works. It started at coast Battery No. 18, and inclosed the old city on the east, north, and northwest, where it terminated at the foot of Quail Hill. It consisted of 4 redoubts connected by a ditch and a parapet. The ditch was 14 feet deep and 28 feet wide. The parapet was 14 feet high and 21 feet wide and was unfinished in places.

The northwest front began on the west side of the Cossack Place d'Armes. Here we find Fort No. IV, which was almost completed. It was on a high steep hill, was without ditches, and consisted only of escarpments. To its right, and somewhat in rear, on the summits of neighboring heights, were Battery C (Tooth Battery), which was completed, and the Sapper Battery. To the left of the fort, in the interval between it and Fort No. V, was Redoubt No. 4, which was completed.

Fort No. V was scarcely begun when the war broke out. It was only a shapeless heap of stones. The front and two flanking ditches had been excavated. The stones which had been taken out of the ditches were to be used to make breast-works. At the angles, excavations had been made for two posterns. Likewise the interior had been excavated to form the terreplein.

In the interval between Forts Nos. V and VI were Redoubt No. 5, which was nearly finished, and Battery E, which was only about half finished. Construction on Fort No. VI had not been begun. The trace had, indeed, been made as well as a slight excavation in the rocky ground at the gorge.

ENGINEERING WORK DONE DURING MOBILIZATION.

Such was the condition of the works at the beginning of the war. Great efforts were now made to place the fortress in readiness for defense. The engineering work done with this end in view was as follows: Forts Nos. I, II, and III and Redoubts Nos. 3 and 5 were hastily completed and measures were taken for the defense of Fort No. V. Intervals were filled in by means of temporary fortifications and intrenchments, and temporary emplacements were constructed.

At Fort No. I the curtain was graded, and the glacis, the gorge, and the bombproof shelters were completed.

At Fort No. II the ramparts and the glacis were graded, a section of the counterscarp gallery was finished, and the second story of the casemates was floored; but there was not sufficient time to construct covered passages from the barracks to the counterscarp gallery and to the interior of the fort. The portion of the counterscarp near the left of the gorge was roughly revetted. The parapets above the gorge casemates were not covered with earth. Traverses had been made along the parapets; also embrasures protected by overhead cover.

At Fort No. III the ramparts and glacis were graded, the interior walls being revetted with cement barrels; the counterscarp walls of the gorge were revetted with stones; a rear traverse was constructed along the entire left flank; transversal traverses were constructed along all the faces; embrasures and bombproof shelters were made; and the gorge was finished, its interior walls being revetted with cement barrels. The rough stone revetment of the rear supporting walls of the gorge was changed to a revetment of stones embedded in cement, with steps for descent from the terreplein through the open caponier into the ditch.

An armor-plated observation tower was erected in the battery in the center of the fort. Openings in the direction of the right flank were covered by high traverses. In rear of the battery behind the traverse and somewhat to the right a large bombproof shelter was provided for the artillerymen. Six feet of earth was placed above the shelter for the guns and 5 feet above the covered passage and gorge casemates.

At each of the four angles of the fort two 57-mm. guns were placed on wooden platforms and a gun of the same caliber was placed in each of the flanking casemates. The casemates and the entrances into the ditch from the passage leading to the barracks were provided with iron doors five-eighths of an inch thick. Shutters of iron plate, five-eighths of an inch thick, with loopholes for firing, were placed in the barrack windows.

Shields were manufactured for the three counter-assault guns for protection against shrapnel and shell fragments. The fort was connected by telephone with the central electrical station and the nearest observation station on Rocky

Ridge, where an armor-plated shelter was provided. In order to cover the dead space in front of the fort a circular trench was made at the foot of the glacis; it was provided with embrasures, screens, and three excellent bombproof shelters.

To the right of the fort, in rear of the nearest height, Caponier No. 3 for two field guns was erected, covered in front by a trench.

The fort was surrounded by a row of simple wire entanglement and an electric fence. In the right casemate an electrical station was established for the fence. The installation of a pipe for the flow of rain water from the terreplein to the ditch was begun but not finished.

At Redoubt No. 3 work was begun on February 10. The wooden molds were removed from the embrasures by cutting and burning; shutters covered with Russian felt were fixed to all the windows; gratings, windows, and stoves were placed in the casemates later, and the entrances from the barracks into the gorge ditch were filled with sand bags. On the first day breastworks were constructed of stones for firing in the lying position, being improved later for firing in the kneeling position and ultimately for firing in the standing position. The interior wall of the breastworks were revetted with cement barrels filled with stones.

In February hundreds of cubic yards of soft earth were brought on donkeys. Work was begun on deepening the ditches, leveling the bottom, and steepening the scarp. At first the counterscarp was lined with stones bedded in cement, but after a few days an order came from the chief engineer of the fortress directing that the revetment be made simply of stones. At the same time the grading of the terrain was begun, the glacis was constructed at the front, and thousands of cubic yards of stone and gravel were excavated. Bomb-proof shelter was provided at the same time for the kitchen, the cooks, and the bread storeroom.

Two bombproof shelters for officers were constructed in March. In April two 6-inch Canet guns were mounted in rear of the gorge, barbettes were erected for the field guns which were to be used as counter-assault guns and for machine guns, and traverses were erected in front of the exit from the postern gate and in front of the kitchen. Additional embrasures and traverses were made in June, and

head cover was provided. A Schwartz observation turret was erected, sand bags filled with cement instead of stone being used for want of time. The fort was surrounded by an ordinary wire fence: fougasses were placed in the ravines to the right and left; and an electric fence was built in front.

At Fort No. IV, which was almost completed, a corduroy road was yet to be covered with earth; the exits of the posterns leading into the ditch were to be securely closed; the section of the outer ditch on the left flank was to be deepened; and windows and doors were needed in the casemates.

At Redoubt No. 4, which was almost completed, the entrances to the gorge were unfinished; obstacles were needed to prevent entrance to the ditch from the caponier; a wide trench on the glacis opposite the caponier was to be filled in, as the field of fire from the trench was limited and the enemy could take cover in it before crossing the ditch; and windows and doors were required in the casemates.

At Battery E doors and windows were required in the casemates. The battery was littered with all kinds of débris, and much time was lost in carrying it away. On or near the breastworks were about 2,000 cubic yards of stone, 400 cubic yards of sand, 1,000 barrels of cement, a large amount of lumber, and a concrete plant, all of which had to be carted away. As the platforms were ready, the six 6-inch guns could be mounted. Of the seven traverses only two epaulments and the central traverse were ready. The uncompleted traverses were transformed into bombproof shelters made of 12-inch beams covered with 3 or 4 feet of earth. There were a few quarters in the battery, but casemates for the garrison, kitchens, latrines, etc., had to be constructed. All these buildings were placed on the right, below the battery. It was necessary to paint some of the new shining corrugated roofs in order to mask them.

Redoubt No. 5 at the beginning of the war was about half finished; the earth and concrete works were completed, but casemates, caponiers, posterns, etc., were not covered with earth; and the interior of the work was filled with material dug up to install drainage. There were no window frames, windows, nor shutters in the casemates, but a few of the armor-plated doors were in place. There were neither bunks nor stoves. As the garrison had to live in the fort, it

was necessary to construct kitchens, storerooms, officers' quarters, and latrines, which for economic considerations had not been included in the concrete casemates. The principal work consisted in transporting material for the manufacture of concrete for the emplacement of guns. Communications were established in the interior of the fort, and the entrance to the fort was closed by a heavy wooden gate with barricades placed in front of it.

Work on Fort No. VI was begun in October, 1903. At the beginning of the war the constructor had only leveled the surface and made a small depression in the gorge. Hence ordinary rifle intrenchments were made here, joined by covered passages, while shelters were constructed of beams covered with earth from 7 to 10 feet in thickness.

An immense amount of work remained to be done on Fort No. V. Enormous shapeless heaps of stone covered the site selected for the parapets and impeded the work greatly. It was a serious problem to determine where to place the parapets. The impossibility of removing the debris in time made it necessary to advance them to the front, where the glacis should have been. They were constructed of stone, the inner side being revetted with cement barrels taken from Battery E and filled with stone. Earth was being carted away at the same time and as much as possible of it was heaped on top of the breastworks. The posterns were made of frames constructed of beams. The frames were covered with two layers of beams, over which was placed a layer of stones covered with cement. Over this was placed a layer of sheet iron one-half inch thick and a layer of pebbles from 2 to 3 feet thick. From the side of the ditch a stone curtain or screen was erected. The posterns served as quarters for the garrison. Four buildings of construction similar to the posterns were erected within the fort and a fifth in the gorge.

Open caponiers with screens and embrasures were constructed to cover the lateral ditches. The parapets were then begun. The lateral faces were divided from the front face by depressions; loopholes were made for small arms and embrasures for guns; and two 6-inch Canet, two 75-mm., and six field guns were mounted. A strong, substantial magazine was constructed in rear of the front face from

Chinese beams, covered with stones, over which cement was poured. A roof of corrugated iron was placed over the whole. Quarters for officers were constructed in the interior of the fort from Chinese beams, covered with stones. Close to the right flank a small magazine for projectiles for the Canet guns was constructed of earth and stone.

Such were the additions made to each of the forts. A hostile descent on the peninsula was daily expected. Hence the work was done with feverish haste and with no semblance of order and the quality suffered in consequence. The intervals between the forts were filled with redoubts and entrenchments having obstacles in front of them.

After May 13 the trenches were provided with loopholes, bombproofs, and wire entanglements, and fougasses and naval mines were placed in the ravines. The front from Fort No. II to Fort No. IV was covered with an electric fence consisting of five insulated wires carrying a current of 3,000 volts. Temporary emplacements for ninety-two fortress guns were constructed on the summits of the hills in rear of the trenches.

NECESSITY FOR PLAN OF ACTION IN CASE OF UNEXPECTED MOBILIZATION.

A month had elapsed since the declaration of war and the enemy had not yet appeared. A greater calm prevailed and the situation was viewed with more deliberation. It was found necessary to occupy and fortify some advanced positions, but no carefully considered plan was followed, and the views of the higher authorities prevailed. Hence work on the position at the aqueduct was begun in accordance with the desires of Adjutant-General Kuropatkin, although the position on Takushan was of far greater importance. The Idol Redoubt was begun to satisfy the wishes of General Stoessel. The Viceroy expressed his fears of a descent in Pigeon Bay under the fortress, and obstinately demanded the fortification of the coast of this bay. The commandant of the fortress insisted that 203-Meter Hill should be fortified, while General Fock insisted upon the fortification of 174-Meter Hill. In short, there was a chaos of conflicting opinions for want of a settled plan in case of mobilization. When the secondary points were well fortified the most important

points had not been touched. Nor would they have been fortified had not General Kondratchenko insisted upon it.

At the beginning of May fortifications were begun on Flat and Division hills and on the ridge of Pachlunshan. The works on Takushan and Siaokushan were not begun until June. Here, where the first blow fell, the solid rock precluded the possibility of doing anything of importance in a short time.

In conclusion we may say that it is necessary, when the construction of a fortress is undertaken, to form a plan of action in case of unexpected mobilization, in which shall be laid down the sequence of work, beginning with the most important and ending with the least important. There was no such plan at Port Arthur, and hence the greatest disorder resulted. Forts were hastily completed, advanced positions were fortified, temporary batteries were erected, and the intervals were filled with intrenchments and redoubts. Three important factors were lost from view:

- (1) The construction of roads for lateral and radial communication concealed from the enemy.
- (2) The establishment of a convenient, durable, and protected telephone system.
- (3) The placing of the enceinte in a defensible condition.

MILITARY ROADS.

The greater part of the well-constructed military roads were laid out in full view of the enemy, and were therefore useless. This was so evident, even during mobilization, that they were called "death roads;" but other roads were not provided. The many overhead telephone lines, though they continued in service until the end, were often shattered in the midst of battle, and became useless when most needed. The enceinte, with its deep ditch and thick ramparts, should have served as an excellent keep, but as it had neither bomb-proofs nor traverses it was useless for this purpose.

CONDITION OF THE FORTRESS AT THE BEGINNING OF THE INVESTMENT.

At the beginning of the investment, July 17, 1904, the land front was in the following condition:

Coast battery No. 22 (four 6-inch Canet guns), constructed during mobilization, was intrenched on the side of Takhe Bay.

At a distance of 1,400 feet from it the line of intrenchments joined Takhe Redoubt and ran along the ridge to Fort No. I. Signal Hill, on the shore of Takhe Bay, in front of this line, was internched and armed with two small Baranovski guns.

To the right of Fort No. I was a battery of small guns covering the approaches to the fort from the right and a similar battery was constructed on the left. The fort itself had concrete emplacements for four 6-inch guns. Four 57-mm and three machine guns formed the armament to repel assault. Trenches ran to the left up to Caponier No. 1 (four light guns), in rear of which were emplacements for two 57-mm guns. The trenches ran from the caponier in a broken line along the ridge to Battery A, which had emplacements for six 6-inch guns. In rear of this section of the line were Redoubt No. 1 on Danger Hill and temporary emplacements on Dragon Ridge for two 6-inch Canet guns.

There were fortified positions in advance of this front. On Takushan were emplacements for three field guns surrounded, at the base of the hill, by trenches and wire entanglements. A new road had been constructed from the front to the hill; and, between Takushan and the main line, on Height 22, were emplacements for two field guns to cover the Nameless River and the Daluy road. The garrison of Takushan consisted of two companies. On Siaokushan were trenches descending to the right along the ridge with wire entanglements in front.

The old Chinese wall ran from Battery A to Redoubt No. 2, an old Chinese work armed with four light field and two naval 57-mm. guns, and thence to Battery B, which was armed with four 6-inch guns. This battery was defended by two tiers of intrenchments. In the interval between Battery B and Redoubt No. 2 were emplacements for two guns to repel assault. On a height in rear of the Chinese wall, somewhat to the south of Battery B, were temporary emplacements (Letters Battery) for two 15-mm. Krupp guns. On the left of Battery B the Chinese wall divided. One branch ran to Kuropatkin's Lunette (four 6-inch mortars) on a small height and continued to Fort No. II. In the ravine in front of the wall, between the lunette and Battery B, there was a small height which was occupied and armed with two light guns

to cover the approaches to Fort No. II and Battery B. Fort No. II was garrisoned by one company. Its armament consisted of four light, four 57-mm., and two machine guns. The other branch of the Chinese wall ran along the foot of Small Eagle Nest, on the summit of which were emplacements for three 4.2-inch guns. To the left of Small Eagle Nest was an emplacement for one Armstrong 21-cm. gun.

Below these batteries near the Chinese wall were placed four 57-mm. caponier guns taken from the casemates of Fort No. II. In the ravine, between Small Eagle Nest and Eagle Nest, emplacements were constructed at the beginning of the siege for two rapid-fire field guns to repel assault. On the summit of Eagle Nest were emplacements for two 6-inch Canet guns. At the foot of Eagle Nest on a height in front of the Chinese wall was Caponier No. 2 for four field guns. On two adjacent heights to the left were two transformed Chinese works, Fortifications Nos. 1 and 2. In rear of these heights behind the Chinese wall on the front slope of the height in rear were temporary emplacements for three 6-inch guns (Redoubts Battery). On the rear slope of this height, somewhat to the left of Redoubts Battery, were well-concealed emplacements for four 9-inch mortars (Wolf Battery). On a small hill in the interval between Fortification No. 2 and Fort No. III was Caponier No. 3 for two light guns communicating by a zigzag covered passage with the Chinese wall. Emplacements for two light guns were at the point where this covered passage joined the wall.

Fort No. III. The garrison consisted of one company; the armament of four 6-inch, three light, eight 57-mm., and two machine guns. From the left angle of the fort, the Chinese wall ran across a deep ravine to Redoubt No. 3. The ravine was covered by the fire of two guns in the Ravine Battery. At the point where the wall joined the gorge ditch of Redoubt No. 3, two 57-mm. guns were emplaced. The garrison of the redoubt consisted of one company and the armament of two 6-inch Canet, five light, and two machine guns. From this work the wall ran around Mound Battery to the railway line. At the point where it left Redoubt No. 3, two light field guns were emplaced in rear of the wall to cover the deep ditch in front. Somewhat to the left of the two field guns were four 57-mm. guns. Mound Battery, which was well concealed,

mounted four 4.2-inch and four 75-mm. guns, and four 6-inch mortars. Near the place where the wall crossed the railway were two small hills. On one of these the Cossack Lunette was erected; on the other were emplacements for two small Baranovski guns.

In rear of this line were the following batteries: On Great Hill, four light guns with an observation station for battery commanders; on Quail Hill, two 6-inch Canet guns and one siege gun; at the Powder Redoubt of the enceinte, two 4.2-inch guns; on the other redoubts of the enceinte, three 87-mm. and two 57-mm. guns with shields, and four light guns.

There was an observation station on the summit of Rocky Ridge to the right of Fort No. III. The approaches to the redoubts and trenches were obstructed by wire entanglements generally in one line, but in places in two or three lines. All the ravines between the fortifications in the intervals were mined. From Battery A to the left to the front and along the entire front ran an electric fence.

The above-described section of the fortress constituted the east and northeast fronts. A military road served for communication between the works on this front and the city. It started from the south gate of the enceinte, ran by Battery No. 19, along the foot and in front of Dragon Ridge, and along the rear of Danger Hill, and approached the front line near Redoubt No. 2. Here it divided into two branches. One branch ran along the rear of the east front. The other ran in rear of the northeast front as far as Mound Battery where it turned south, ran past the arsenal, and reentered the city through the northeastern gate. Another road started from the central gate of the enceinte and divided into two branches in the new Chinese city. One branch ran west of the new city along a well-concealed valley to Fort No. III, while the other ran northeast along a ravine past Great and Spur hills to Redoubt No. 2 and Letters Battery.

It is necessary to mention the auxiliary means of defense. Searchlights were installed on Battery No. 22, on Forts Nos. I, II, and III, on the Chinese wall, in the interval between Fort No. III and Caponier No. 3, and on Mound Battery. Current was supplied by dynamos placed in ordinary buildings partly bombproof. All of the searchlights except that at Fort No. III could be moved on trucks over railways. Dressing sta-

tions for the wounded were established in the vicinity of Battery A, in the ravine in rear of Fort No. III, and on the road leading from this fort to the new Chinese city. -

The enceinte, as has been said, consists of *cremaillère* and polygonal fronts joining four redoubts. Notwithstanding the fact that the ditch was wide and deep and the ramparts high and thick, it had some very serious defects. Owing to a defective plan the greater part of the enceinte would, after the fall of the outer line, be subjected to enfilade and reverse fire; the redoubts were scarcely large enough to hold a half company each: there was neither fireproof nor bombproof shelter nor traverses along the entire line; and the height of the breastworks was from 3 to $3\frac{1}{2}$ feet, which, without enabling the men to fire standing, prevented them from firing in the kneeling position. In the old city, in rear of the enceinte, were the Red Cross and military hospitals, the depots of supplies, and the headquarters of the fortress. Communication was carried on by means of telephones, semaphores, and orderlies, furnished by one *sotnia*^a of cossacks and a command of cyclists. Headquarters was connected by telephone with chiefs of fronts, and chiefs of fronts with commanders of forts, batteries, and other works, and regimental commanders. The batteries were in communication between themselves and with observation stations. Unfortunately, the system was not sufficiently developed, and all wires were overhead.

The line of permanent works began at the arsenal by a line of intrenchments which crossed the Cossack place and terminated at Cemetery Redoubt. In front of this line of intrenchments were obstacles consisting of a ditch filled with water, *chevaux-de-frise*, fougasses, and wire entanglements. Cemetery Hill, on which Cemetery Battery was located with six 75-mm. guns, Cemetery Redoubt, and emplacements for a battery of 4.2-inch guns, was surrounded by trenches. On Tooth Hill, to the left of Cemetery Hill, was Battery C (emplacement for four 6-inch guns). Somewhat below Battery C were emplacements for four 6-inch mortars, and somewhat to the left was the Sapper Battery (emplacements for four 6-inch guns). Both hills were surrounded by one tier

^a The fighting strength of the *sotnia* is 4 officers and about 150 men.—Tr.

and in some places by two tiers of trenches. Fort No. IV was in front of these hills on a very high and steep height. Its garrison consisted of one company and its armament of four light, four 75-mm., and two machine guns. To the left of the fort were emplacements for four 6-inch mortars and two light guns. There were advanced fortified positions all along this entire front.

The river Lunhe was closed by the so-called aqueduct position, consisting of Aqueduct Redoubt (Fort Kuropatkin) and Idol Redoubt and a line of trenches. Two emplacements for field guns were constructed in the intrenchment between the redoubts. Most of the construction on Idol Redoubt was done in time of peace. During mobilization two lunettes had been constructed in its rear. Pachlunshan Ridge was occupied and fortified with two lunettes and a battery to support Idol Redoubt. All these works were surrounded in front by a trench. The Chinese wall began again at Battery D and ran along Redoubt No. 4. The garrison of this work consisted of one company; the armament, of four 6-inch, eight light, and two machine guns. The interval between Redoubt No. 4 and Fort No. V was defended by two rows and in some places by three rows of trenches and fieldworks.

The garrison of Fort No. V consisted of one company; its armament, of two 6-inch Canet, two 75-mm., five light, two Baranovski, and two machine guns. There were temporary emplacements for four 75-mm. guns (Pigeon Battery) on a height in rear of Fort No. V. There were also emplacements for two light guns alongside the fort and for four light guns somewhat to the left of it. A little farther south were permanent emplacements (Battery E) for four 6-inch and two light guns. Redoubt No. 5 had four 4.2-inch, four light, four Baranovski, and two machine guns. The interval between Redoubt No. 5 and the site of Fort No. VI was filled with a series of intrenchments, lunettes, and field batteries, in front of which were wire entanglements and trous-de-loup. In the trenches on the site of Fort No. VI were four 4.2-inch and four light guns. Its garrison consisted of one company. From Fort No. VI the trenches ran across Salt Hill, where a redoubt was constructed and joined the seacoast battery, the so-called "White Wolf," on the left flank of the land front. In front of the interval between

Forts Nos. IV and V a group of heights was occupied, of which 174-Meter Hill and Division Hill were fortified.

The works between Redoubt No. 4 and White Wolf Battery constituted the west front. 203-Meter Hill, commanding this section, was very weakly fortified. On its summit were emplacements for three 6-inch guns, surrounded somewhat lower by an unbroken trench and wire entanglements. On the three summits of Liaotesshan were constructed three sets of emplacements for 6-inch guns. Small sections of rifle trenches were constructed on the shore of Pigeon Bay. All the permanent works on the front were in the immediate vicinity of the new city, almost on its outskirts. A road ran through the new city, with branches to Battery E, Redoubt No. 4, Fort No. IV, Redoubt No. 5, and Fort No. V.

ARMAMENTS AND FORCES OF THE BELLIGERENTS.

The armament of the land front consisted of the following guns, mortars, and machine guns:

21-cm. guns	2
15-cm. Krupp guns	2
9-inch guns	8
6-inch guns, of 6,862 pounds	33
6-inch guns, of 4,334 pounds	34
4.2-inch guns	24
Light guns	155
57-mm. guns	27
6-inch field mortars	22
Machine guns	48
87-mm. guns	8
Total	363 ^a

There were 315 guns and mortars and 48 machine guns. In addition to the foregoing the following naval guns were installed on the land front:

6-inch Canet guns	14
6-inch short guns	2
120-mm. guns	1
9-pounder guns	1
75-mm. guns	28
47-mm. guns	22
37-mm. guns	17
Total	^a 81

^a Note the error in addition here (should be 85), which occurs in the original.—Tr.

The total armament of the land front consisted of 396 guns and mortars and 48 machine guns. There was, moreover, a mobile reserve consisting of 4 batteries of rapid-fire field artillery of the Fourth Brigade, 3 batteries of the Seventh Division, and 1 battery of 57-mm. guns, a total of 60 guns. Hence there were 456 guns in the fortress.

The garrison of the fortress consisted of 9 rifle regiments of 3 battalions each, 2 companies of frontier guards of the Kuangtung naval brigade, 1 company of sappers, 1 railway company, 1 mining company, and 1 sotnia of cossacks. At the time of the investment the garrison consisted of 27,000 bayonets.

The besieging army consisted of 3 divisions and 2 brigades with their field artillery, one artillery regiment per division, each regiment consisting of 4 eight-gun batteries. Thus in six regiments there were $6 \times 32 = 192$ guns.

The siege park consisted of 106 guns and mortars, as follows: ^a

120-mm. guns.....	66
6-inch guns.....	22
8-inch guns.....	2
11-inch mortars.....	16

106

In addition to the foregoing there was a number of 6-inch, 12-pounder, and 4.7-inch naval guns and mountain artillery. The total number of hostile guns was not less than 300. These guns were well placed on the opposite slopes of the ridges and were well masked.

Such were the forces of the belligerents.

COMMENTS.

Having shown the condition of the fortress for resistance, we shall now make the following comments:

1. The right of the outer line was carried too far to the rear, thus bringing it too near the enceinte. It would have been of great advantage to have rested the right on Siao-kushan and Signal hills and to have included Takushan in

^aAccording to certain information the artillery consisted chiefly of howitzers.

the main line. Thus the front would have been shorter and stronger.

2. Takushan and Siaokushan hills were poorly fortified, with fatal results.

3. The forts were at a distance of 2 to $2\frac{1}{3}$ miles from the center of the city on the east front and $\frac{2}{3}$ mile on the west front. These distances were too small and allowed the city to be bombarded, not only with big guns, but with field and mountain guns.

4. Of the six forts one was completed, three were half finished, one was marked only by a ditch, and one was not yet begun.

5. Numerous ditches and ravines cutting the intervals between the forts were not covered by fire in any way.

6. Some of the forts were so situated as to be invisible from adjacent forts. Hence they were incapable of mutual support.

7. The intervals between the forts were filled by intrenchments and old Chinese fortifications, from which a grazing fire could not be delivered. They were not sufficiently secure against assault and were ill adapted to resist artillery fire.

8. There were no rear caponiers in the forts. The open gorge caponiers were not rationally constructed.

9. On account of the unfinished state of the forts and redoubts they were surrounded by dead zones, with the exception of Redoubt No. 3.

10. Guns of various caliber were placed in the same work.

11. Shelters for guns to repulse assaults were insufficient in number.

12. In some of the casemates of the forts there were no flanking guns. This is one manifestation of the general neglect of flank defense for the ditches.

13. The concrete walls of the casemates were only 3 feet thick.

14. The temporary emplacements for large-caliber guns were all erected on the summits of hills and could easily be seen from a distance.

15. The mortars were insufficient in number and most of the guns were of an obsolete type.

16. The forts, redoubts, and batteries were not masked and could easily be seen from a distance.

17. The roads along the fortress front and back to the city were too much exposed to the view of the enemy.

18. There were no other means of communication, such as permanent and field railways.

19. There was not a sufficient number of observation stations in the intervals and in the rear.

20. No preparations had been made for safe and secure observation. The turrets constructed for this purpose in some of the works afforded protection only against shrapnel and shell fragments.

21. The telephonic communications for the control of artillery fire were not independent, but were a part of the general system, and were therefore very defective.

22. The telephone system was entirely above ground, the wires being strung on posts.

23. There were only fifteen searchlights, twelve of which were stationary.

24. The apparatus for wireless telegraphy had been installed but was not used.

25. There were no balloons in the fortress.

26. The stores of the engineers were limited as to instruments and material and were still more depleted by sending part of them to the army before the beginning of the siege.

LABOR AND TRANSPORTATION EMPLOYED DURING MOBILIZATION.

The completion of the forts, the construction of temporary batteries, and the filling in of the intervals lasted five and one-half months.

The lack of official reports, unfortunately, does not allow us to give exact information as to the number of workmen employed during this time on the different positions, the amount of material expended, and the number of vehicles used for carrying the material. But in view of the great importance of such information under similar conditions we shall give such information as we possess. Three-fourths of the Seventh Division—about 8,000 men daily—were detailed to the works during February and March. During April and May this number was decreased to 2,000. After May 15 the Fifth Regiment was added, thus giving 1,000 more per day. In June and July about one-fourth of the force was at work

on the positions—that is to say, not more than 3,000 men per day. About 6,000 Chinese were daily employed on the works, which was equivalent to the addition of 4,000 Russians.

Thus 12,000 men were employed daily during February and March, giving (59x12,000) seven hundred and eight thousand workdays. During April and up to May 15, about 10,000 men were employed daily, giving four hundred and sixty thousand workdays. During one-third of May, June, and July, about 8,000 men were employed daily, giving four hundred and eighty-eight thousand workdays. Thus one million six hundred and fifty-six thousand days' labor were expended upon the works, or one hundred and eighteen thousand two hundred and eighty-six days per mile, assuming that the line of defense extended 14 miles.

For a modern fortress with a perimeter of 27 miles and a garrison of 40,000 men, 1,496 men per mile should be detailed to complete the works in seventy-nine days, or 1,000 men per mile to complete them in one hundred and eighteen days.

One hundred and fifty two-wheeled vehicles were furnished daily by the Seventh Division, and about 80 Chinese arbas were employed; a total equivalent in carrying capacity to 200 two-wheeled vehicles.

CHAPTER IV.

(See Plates I and XI.)

IMPORTANCE OF ADVANCED POSITIONS—IMPORTANCE OF CONSTANT OBSERVATION OF THE INTERVALS BETWEEN FORTS AND OF PROVISION FOR COVERING THE INTERVALS WITH RIFLE FIRE AS DEMONSTRATED BY THE FIRST GREAT ASSAULT—INTERMEDIATE REAR CAPONIERS.

Having described the fortress in its three stages of development, commented upon some of its peculiar features, and compared the forces of the belligerents, we shall now describe certain actions which demonstrated the importance of the different works and exposed defects in the methods of fortification generally accepted in Russia.

On July 30, 1904, the troops were driven within the works and the siege began. The enemy having forced us to evacuate Feng-huang-shan occupied it himself and immediately began to fortify it.

The line of investment ran along the summits of this ridge and extended almost parallel to our north and north-east fronts. In the beginning it formed very nearly a straight line parallel to our center and at a considerable distance from our flanks. The works on Takushan prevented the enemy from approaching our right flank while those on 174-Meter Hill held him at a considerable distance from our left. Hence the importance of these positions was immediately perceived. It became clear that as long as Takushan and 174-Meter Hill were in our hands we could maintain possession of Takhe Bay, Pigeon Bay, and the entire plain between the shore of Pigeon Bay and the works on our west front. It was also evident that until 174-Meter Hill was captured the investment of the west front was impossible. The great tactical importance of these two hills did not escape the Japanese. In addition to other advantages offered by their possession, these hills were of still greater importance to the Japanese, as the Russian batteries on their summits prevented the Japanese from constructing advanced siege batteries.

Hence, in order to establish a close investment and to utilize commanding positions for siege batteries, the enemy had to take Takushan and 174-Meter Hill. Before undertaking decisive movements he awaited the concentration of his army, the completion of arrangements to secure his line of investment, and the construction of batteries behind Fenghuangshan. Not until August 9 did he begin to attack our advanced positions. The result of numerous obstinate attacks was the capture of Takushan and Siaokushan; 174-Meter Hill still held out. It prevented the enemy from extending his line of investment to our left, but the capture of Takushan enabled him to attack our right.

The importance of advanced positions has often been discussed at home and abroad. Only a short time ago Mr. Timchenko-Ruban, in his pamphlet, *A Few Words on Port Arthur*, in speaking about planning fortresses, endeavored to explain the rôle of advanced positions and the importance of the struggle for their possession. He said:

Some have called attention to the fact that the siege of Port Arthur showed in a definite manner the importance of advanced positions and the part which such positions played in prolonging the resistance of the fortress and have shown the necessity of including within the defensive lines the greatest possible number of advanced positions. Others have not agreed with this view. They do not believe in a departure from what have been considered the fundamental principles of fortress warfare by giving too much importance to advanced positions. They maintain that such positions, hastily constructed and occupied at the expense of men and material and incapable of offering sufficient resistance to the enemy, lead to the useless sacrifice of part of the fortress artillery and garrison. Bearing in mind the chief function of fortifications—that of supplying a lack of men by the use of works—I am inclined to think that they are right.

Laying before us two diametrically opposite views, Mr. Timchenko-Ruban leans toward the second and does not deem it advantageous to use advanced positions.

Somewhat further he says:

The advanced positions played a secondary part at Port Arthur. The greatest resistance was offered by the line of forts.

On the following page he concludes:

If we add to the above that Fortifications Nos. 1 and 2, included in the perimeter of the fortress, were taken by the attack on August 22, we see clearly how erroneous were our suppositions with regard to the rôle of advanced positions and advanced fortifications.

I do not concur in the opinion of the author. I shall now attempt to give some information which will throw light upon this question.

In planning a fortress care is taken to place the works at points which are capable of defense and which have a special tactical importance. If the fortress be situated in a plain and if the forts be placed so as to command a level terrain which may be easily observed and covered by fire, it is natural that the entire defense should devolve upon the line of forts. But such cases are extremely rare. The terrain in front of fortresses is generally hilly and broken.

In front of the fortresses there are positions consisting of separate hills or of groups of hills. According to their relative situation, height, adaptability for defense, and distance from the fortress, some of these positions assume, during the siege of the fortress, great importance both for the attack and the defense. Because of economic considerations no permanent fortifications are constructed on these heights during peace; but they are occupied during mobilization, the works constructed being, for want of time, of a temporary character called "advanced fortified positions."

Such was the case at Port Arthur. It was remarked at the time the works were building that the terrain in front of the line of forts was so broken by all kinds of ravines, ditches, canyons, and hills that at a distance of two-thirds of a mile from the fortress there were areas which could not be reached by fire. Such a conformation of the terrain was very favorable to the enemy, enabling him to concentrate his troops in security behind ridges and in ravines close to the fortress and convenient for assault.

In front of our line of forts at distances varying from 1 to $1\frac{1}{2}$ miles were commanding positions at Takushan, Siao-kushan, 174-Meter Hill, and 203-Meter Hill. These heights were appreciated at their true value by Colonel Velichko, who decided to occupy them with permanent fortifications, but economy stood in the way. They were forgotten and remembered only a short time before the siege began.

Takushan commanded all the forts and redoubts on the east front. From its summit could be seen not only the forts but all the roads between the forts and those running back to the enceinte, the temporary batteries in rear, the enceinte,

the city itself, part of the harbor, and the vessels in the roadstead. It also served the enemy as an excellent shield to cover his position in rear of its northeast slope. It was impossible to see what was taking place there from a single fort or redoubt.

The possession of this hill enabled the defense to follow the distant movements of attacking parties and harass them; to force the siege batteries to take up distant positions and thus to save the city in a great measure from bombardment; and to bring a flank and reverse fire upon all storming parties assailing the east front, thus precluding the possibility of assault on this front.

The possession of this hill by the enemy enabled him to observe not only the entire area in rear of the forts of the east front, but all our movements and changes of position and some of the vessels in the inner bay; to correct by observation his fire against our forts and batteries, so that even 11-inch shells struck our guns at the second shot; and to secure the flank of the line of investment and facilitate storming the east front.

From the foregoing comparative statements it is easy to understand the great value of this hill both to the attack and the defense. Hence the obstinacy of the Japanese in trying to capture it and the determination of our commandant to retain it. But it is hard to comprehend the indifference to its importance, the lack of appreciation of its value, and the languor in fortifying it while danger was yet afar off.

The war began February 6. It was not until June 19 that work on Takushan was begun, it having been decided to place there two companies and eight guns. The natural solid rock impeded the work and very little had been done when the Japanese appeared before the fortress.

The fortress was invested July 30. Not until August 2 did we decide to construct two closed works on Takushan and Siaokushan. Engineer Rashevski was ordered to complete the work as quickly as possible. He began most energetically, but the Japanese understood too well the importance of these hills. They impeded the work by shrapnel fire and five days later began a series of attacks. They took the hills August 9. If Takushan had been appreciated at its just value and fortified in time, it would not have been

taken so quickly nor so easily, if we may judge by our experience near the aqueduct.

During the first week of the investment the Japanese erected siege batteries behind Fenghuangshan, where they were comparatively safe from molestation. They could not begin such batteries in the vicinity of Takushan until the hill was captured; nor would they risk an assault on the eastern front before taking Takushan, although they fully realized that a day lost by them was a day gained by us. They completed their batteries on Takushan on August 16. With a good observation station on this hill for fire control and for general purposes, they could now operate against our east front with all the advantages possessed by the umpire in a game of *kriegspiel*.

On August 22 they took Fortifications Nos. 1 and 2 by assault. With the assistance of the captured works they began operations against Forts Nos. II and III. Could they have threatened a single one of these works with a hostile garrison in their rear on Takushan? Certainly they could not. How is it possible, then, to maintain seriously that advanced positions lead to the useless sacrifice of part of the fortress artillery and garrison? It is necessary, indeed, that such positions be really fortified positions—not mere naked hills. In occupying them the chief function of fortifications should not be forgotten—that of compensating for a lack of men by the use of works. The blood of the defenders should not compensate for the lack of works.

The enormous importance of Takushan was realized by Colonel Velichko, who proposed to erect here a strong point of support. This was not done for reasons over which he had no control. His idea was misunderstood, unappreciated, forgotten. The period of mobilization was so long that a strong temporary fortification with substantial obstacles might have been erected. The general features of the hill, the steepness of the slope toward the enemy, were very favorable. But nothing commensurate with the importance of the place was done toward fortifying the hill; for it must be admitted that what might have been well done in five months, could not, in this instance, be done at all in one. This shows again that not only the intervals between the forts, but important advanced positions should be fortified in time of peace. Taku-

shan fell early and led to a useless sacrifice of men and material only because it had not been fortified.

The history of 203-Meter Hill illustrates our view of the value of advanced positions. The works here were more extensive than those on Takushan, and they were manned by the heroic Fifth Regiment. They withstood repeated furious assaults for four months and caused a loss of 20,000 men. The importance of the hill was realized by both sides; no efforts were spared to capture it, and the greatest obstinacy was displayed in its defense. When at last it fell, on December 5, the weary, heartbroken Kondratchenko said, "This is the beginning of the end." Three days later the remnants of the Pacific Squadron were resting on the bottom of the sea, and a month later the fortress had fallen.

The position at the Aqueduct, much better fortified than the others, held out to the end. The position on Pachunshan remained partly in our hands until the end, and, with that on Division Hill, prevented the enemy from executing his skillful maneuver of 1894 against the Chinese. It is impossible to limit the application of the principles of fortress warfare to a line of forts. The use of advanced positions is not contrary to these principles, but forms a most essential part of them. The essential feature of fortress warfare consists in the use of all possible means to prolong the defense, yielding the ground inch by inch; hence the endeavor to take advantage of important advanced positions adapted to defense, is the only means to carry out the cardinal principle of fortress warfare.

It may be urged that the use of advanced positions at Port Arthur was unavoidable on account of the unfinished condition of its fortifications. Let us suppose, however, that the fortress were completed according to the project. Would there have been any necessity to occupy advanced positions? If we examine the map of the Kuangtung Peninsula, the most striking feature which arrests the eye is the long ridge of Fenghuangshan extending at a distance of $1\frac{1}{3}$ to 2 miles in front of the line of forts. It is high and rather steep. A great valley, 7 miles wide, extends beyond it.

Along this valley run the principal roads to Port Arthur, and only through this valley could a siege train be taken to Port Arthur. Here only was it possible for the besiegers

to establish their great depots, camps, and lines of supply. All that takes place in the valley is hidden from the view of the fortress by Fenghuangshan. The occupation of this ridge by the enemy secured his entire front. The fortress could not, therefore, interfere in any way while the enemy was bringing up supplies and concentrating to attack. On the other hand, if we had had long-range rapid-fire guns on this ridge, the enemy could easily have been kept out of the valley and deprived of the use of the bays of Ten Ships and Yenhentzu. He would have been compelled to concentrate against our right flank in a hilly locality without roads or level space to assemble his men and munitions of war.^a The construction of railways in such a locality would have been very difficult and the transportation of mortars quite impossible. Would the siege have been successful under such circumstances? We think not.

It will be granted that the condition of the fortress was such that Fenghuangshan could not be occupied; but it would have been imperative to occupy it as an advanced position, had the fortress been completed.

It has been asserted that the use of advanced positions has been condemned by the majority of those who have been qualified to express an opinion. Such is not the case. Let us recall how this idea was spread in the eighteenth century by Carnot, the "organizer of victories;" let us recall Carnot's operations at Antwerp in 1814, Davout's at Hamburg in 1813, and 1814, and Rapp's at Danzig in 1813, and the more recent sieges of Sebastopol and Belfort. Todleben, who, at the beginning of the siege of Sebastopol had not occupied the advanced positions on the Kilen-balka Heights, in front of the Malakhoff Mound and on the shore of Quarantine Bay, realized their importance during the siege and insisted upon occupying them. At Belfort advanced positions, even with weak garrisons, played an important rôle.

These examples prove that the defense should not be limited to a passive resistance within the fortress. It is a fatal mistake to await patiently the enemy's attack, allowing him to occupy advantageous positions and to make preparations

^a This view was expressed by General Fock before the investment. It was confirmed during the siege.

for assault. It is wise to impede his movements at a distance from the fortress and make each step in advance more and more difficult for him. In addition to other advantages, the active defense of a fortress, which consists chiefly in opposing the enemy in advanced positions, helps to maintain the spirit of the garrison which is a very important element in war.

Of course it is impossible to occupy and defend every hill in front of fortified works. Only those positions should be occupied which may be of importance during the siege on account of their situation, adaptability for defense, height, and distance from the fortress. Hills which have these advantages should be occupied, fortified, and defended.

IMPORTANCE OF CONSTANT OBSERVATION OF THE INTERVALS BETWEEN FORTS AND OF PROVISION FOR COVERING THE INTERVALS WITH RIFLE FIRE AS DEMONSTRATED BY THE FIRST GREAT ASSAULT.

After taking Takushan the enemy attacked 174-Meter Hill, and, after a series of attacks, succeeded, on August 15, in taking the approaches. The attack on the hill itself showed the impossibility of quickly constructing siege batteries and investing the fortress from the west; 174-Meter Hill must first be taken. It was difficult to foresee the result of another attack, although it was only a question of time when the hill must fall. In the meanwhile Marshal Oyama began to advance against General Kuropatkin, but his forces were not sufficient to inflict a decisive defeat upon our Manchurian army. Hence Marshal Oyama demanded of General Nogi the speedy capture of Port Arthur. Actuated on the one hand by the desire to march to the support of Oyama, and on the other by the example of 1894, when he had successfully stormed Port Arthur with his brigade, General Nogi decided to assault the fortress according to the plan recommended by the Bavarian General Sauer.

We find in the interesting book of David James^a a detailed and exact description of this enterprise, which is here inserted.

^a The siege of Port Arthur, by David H. James, London, T. Fisher Unwin, 1905, pp. 67-90.—Tr.

Roughly, the plan of assault was as follows: Wantai (Eagle Nest),^a in the center of the north-eastern sector, was the objective. From Wantai it was proposed to drive in a wedge between the eastern fortifications, and take the Ehlung (Fort No. III) and Sungshu (Redoubt No. 3) forts in reverse. This accomplished, the captured ground was to serve as the basis of a general movement against the town. An overwhelming rush was to carry the secondary line of eastern defenses, to swamp the garrison and reduce the rest of the position by storm. There was a good deal of rush necessary for the successful carrying out of this plan, and success depended largely on the suddenness and daring of the scheme. The preceding operations, it will be remembered, took the form of a demonstration against the west by the first division. This feint attack was made with a two-fold object: first, to create a diversion, and delude the garrison into the belief that the Japanese were following in detail the successful operations against the Chinese in 1894; and, secondly, to allow the ninth division to steal the ground necessary for frontally attacking the Panlungs^b (the first obstacles en route to Wantai). (In fact, under this ruse the ground was actually occupied by the ninth division previous to the 19th of August.) On the 19th of August the disposition of the investing force was as follows:—

Right Wing.—First division (First and Second Brigades, Tokio, regiments 1, 15, 2, 3), from the northern shores of Louisa Bay in an almost straight line to the foothills a quarter of a mile north of Sueishi village.

Center.—Ninth division (sixth and eighteenth brigades, Kanazawa, regiments 7, 35, 19, 36), from north of the Sueishi village curving over the valley and crossing the railway at a point half a mile due east of the Panlungs (Fortifications Nos. 1 and 2) and northwest of Ta-ku-shan.

Left Wing.—Eleventh division (tenth and twenty-second brigades, Shikoku, regiments 12, 43, 22, 44), a line from the east coast—parallel to the eastern fortifications at a distance of 1,000 yards—to the foothills of Ta-ku-shan.

General Reserves.—Two independent brigades, 18,000 of second reserves (six regiments, 1, 15, 16, 30, 38, 9), under direct orders of General Nogi.

These infantry reserves were bivouacked in groups upon terraces cut in the reverse slopes of the hill, where they were absolutely safe from shell fire. General Nogi was in touch by a perfect system of telephone wires with all branches of troops, while the hospital service was directed similarly by General Ochai. Ammunition columns,

^a The English author's place-names and spelling have not been altered. Names used in this publication have been inserted in parentheses or added in footnotes, where they differ from those used by the English author.—Tr.

^b Fortifications Nos. 1 and 2.—Tr.

commissary depots, pioneer corps, engineers, sappers, and auxiliary arms were in direct communication with headquarters, as also the naval detachment, while wireless communication was maintained from Daluy and Shao-ping-tao with the blockading squadron under Admiral Togo.

The bulk of the artillery, including the siege park, was emplaced upon a semicircular line extending from the east coast to the western plain near Louisa Bay; the center of this artillery line was a mile and a half to the north of the Erhlung (Fort No. III) hills, and zig-zagged at irregular distances to the east and west. The artillery was not evenly distributed, for the majority of howitzer batteries were screened in the Feng-hwang-shans.

About 300 pieces of cannon in all were ranged against the fortifications, and included 15- and 12-centimetre howitzers (ten batteries of these), 9-centimetre howitzers, and some old 21-centimetre howitzers captured at Nanshan, 4.7 and 12-pounder naval guns, 6-inch siege guns, and mountain artillery batteries.

Two naval 6-inch guns were brought up from Daluy, but were not emplaced in time for the first assault.

All guns were beautifully emplaced, the battery positions on the reverse slopes of the hills splendidly concealed and masked on the flanks by sandbags and mounds artificially blended with the hillside. The units of the batteries were in subdivisions of the emplacement, and traverses of sand bags protected the working numbers of the gun detachments.

From the siege park a heavy concentration of direct fire upon the eastern forts was possible, but the presence of the north and central hills prevented similar fire being brought to bear on Tai-yang-kou, etc.

The artillery commander, General Teshima, directed the battery fire from Observation Hill (center Feng-hwang-shans), from which point a systematic network of telephone wires connected up subordinate artillery observation points and the balloon section operating in the rear.^a The Japanese took every precaution to insure success, and made the utmost of a favourable position for attack. From the highest to the lowest, from general to private, all obeyed with cheerful cooperation the word of General Nogi, who was in supreme undisputed control of the operations from skirmishes to concentrated artillery fire.

The hopes of the troops ran high on the 18th of August when the gun crews rested from their drill and commenced to prod the Russian fortifications with sighting shots, and early the next morning to open a general bombardment of the entire line.

The hopes of other less important individuals went up with a bound the next day, for the Pen Brigade (war correspondents) were accorded an interview with the commander-in-chief, General Baron

^aA very important indication of the excellent manner in which the artillery fire was conducted and the communications were organized.

Nogi, at Shwang-tai-kou, and after a kindly welcome were cheerfully informed that "you have come just in time to see the close of a successful campaign,"^a and, under an escort of official interpreters (whose qualification for this position was misinterpretation of general orders and qualities of irritation), were marched to the firing line. Feng-hwang-shan was allotted as an observation post, and from this point I will describe the events of the first few days.

The Japanese artillery were now (9 a. m., 19th August) busily engaged covering an attack on 174 Metre Hill by the right wing of the first division. Divisional artillery had moved up, and were lending general support to this attack, while a couple of batteries of howitzers were engaging the garrison of I-tzu-shan (Fort No. IV). Shortly afterwards the division artillery opened up with shrapnel on 174 Metre, and bubbling wreaths of smoke were floating over the hill when the infantry of the 15th Regiment could be made out skirmishing over the slopes with fixed bayonets. At this time a rattle of musketry announced the volleys of the defenders; the line of Japanese bayonets thinned and retired to cover. An astonishing general rapid fire had now been developed by the entire siege park, to which the Russians returned a slow, spasmodic reply, making indifferent practice. There was now evidence of infantry movement in our immediate front, in the Sueishi valley. A detachment of the right wing of the first division were endeavouring to work into the Sueishi village, and maintaining a sharp exchange of rifle fire with the Russian outposts in this part of the field. Farther west the 15th Regiment made an assault on 174, but, being smartly shrapneled, were again forced to retire. A brigade of reserves was at this time dispatched to reenforce the right wing, and in the afternoon the artillery concentrated on the eastern forts and succeeded in silencing the two Paulungs (Fortifications Nos. 1 and 2) and "P" fortification (Caponier No. 2). A further attempt to storm 174 was made at two in the afternoon, and they had gained the glacis entanglements before the Russians on the left flank (from the hills^b south-east of 174), opened up a murderous rifle and machine-gun fire, which the Japanese artillery, being unable to silence, little clusters of the 15th were quickly bolting for cover, smartly shrapneled as they made for shelter. This was, however, not the main attacking force, and the glasses failed to locate them, for they were pressing the attack all afternoon, and a heavy fire was maintained till evening from the direction of the west of the hill. The Russians slowly awakened more cannon, and commenced searching in the foothills for the howitzer batteries, but met with no success. On the other hand, the Japanese practice appeared to be steadily improving and bearing fruit, for the eastern line was now smothered in a dense black cloud of earth and smoke, and by twilight scarcely a shot was fired from the Russian line, save in the west, where small-arm

^a Note the confidence of the Japanese commander in the success of the enterprise.

^b Long Hill.—Tr.

fire broke out afresh. The day, one of brilliant sunshine, was but the curtain raiser, the preliminary practice of the orchestra of 300 guns.

* * * * *

Long before daylight we were afoot and tramping back to the firing line. The Japanese had maintained their general howitzer fire throughout the night, and we were not a little anxious to ascertain the changes in the position of the infantry. The hills were already ringing with echoes when we spread ourselves over the rocky summit of Feng-hwang-shan and swung anxious eyes over the position. The citadel was bathed in all the glory of morning sunshine, and from behind the fortified ridges rose the lazy curling smoke of morning fires, drifting in wreaths to the sky. Signal flags fluttering in the halyards on Golden Hill; a couple of slim torpedo boats slipping into the harbour from night patrol; in the West Port a tug slowly steaming up to a sheer-legged pontoon alongside of which lay a many-funneled torpedo boat—apart from this there was a heavy silence brooding over the fortifications.

In the lines of the invaders there was ceaseless activity. The over-night bombardment had enabled a field battery ^a to establish itself a few hundred yards to the north-east of the Erhlung lunette (Aqueduct Redoubt). Infantry were already picking their way through the water courses, and ammunition was being passed along to the Japanese infantry hidden in the broken ground of the valley. All morning the artillery pecked away at the forts in a busy manner, with less rapidity and better practice than on the previous day. Shortly before noon the right of the artillery concentrated on 174 Metre Hill, and the 15th Regiment developed its attack from ground won overnight, the sappers having destroyed the entanglements by cutting the stakes (the wire having previously resisted all the efforts of the pioneers with sheers).

The artillery ceased its fire on 174 Metre Hill, when the Japanese infantry negotiating the obstacle stormed the trenches.

* * * * *

The vigilance of the garrison and the havoc wrought by the machine guns, aided by the clever handling of the searchlight when the Japanese reached the entanglements, defeated the attempts of the Japanese to gain the ground necessary for developing the assault. At 8 o'clock in the morning a small force rushed and carried the "P" fortification (Caponier No. 2) at the point of the bayonet, but were quickly shelled out, and forced to retire with the other troops. The attacks on "Q" fortification (Kuropatkin Lunette) were easily checked, and the infantry operating in this work were unmercifully handled in the morning before the Japanese artillery could smother the Russian fire and cover their retirement. The lines of stretchers, with their burdens of torn flesh passing through the shady kowliang fields all morning, were conclusive evidence of the hard night's work.

^a This was made possible by the high kaoliang in the fields.

At the railway station of Chang-ling-tsu^a (the supply hospital for Dahly) I counted a battalion of severely wounded men brought in from a couple of regiments of the ninth division, and this before ten o'clock in the morning.

Elsewhere in the field hospitals and dressing stations there were overflows of wounded men, waiting in silent groups for attendance. It had been a night of discovery, and of very unpleasant discovery, for the Japanese, who still desired to storm Port Arthur.

The morning was given over to the artillery, and especially the naval brigade, which kept up a furious direct fire on the Panlung (Fortifications Nos. 1 and 2). During the afternoon a detachment of pioneers, about half a company strong, carried out demonstrations against the entanglements, fixing nooses around the stakes by which many of the posts were hauled down.

Others, rushing up to the entanglements, fell down and feigned death, then crawling under the wires turned over on their backs, and, manipulating sheers, succeeded in cutting gaps in the obstacle. But the Russians soon discovered this ruse, and commenced a systematic slaughter of all wounded or seeming wounded lying anywhere in the vicinity of the entanglements. And many innocent Tommies were drilled full of holes to make sure that they were not shamming death for strategical purposes.

The Sueishi lunettes (Idol Redoubt and two lunettes) were peppered with shrapnel during the afternoon, and the Russians retaliated by shelling the village. The naval brigade was located soon after midday from its peculiarly short barking report, and the tars stuck manfully to their guns, although they were hopelessly out-classed in metal by the Russian 11-inch howitzers. Before sunset the Japanese opened a rapid fire, which was smartly replied to, and a terrific cannonade closed a practically uneventful day.

On the afternoon of August 21, General Nogi ordered a brigade of reserves to support the ninth division, and the plan of assault to be advanced another stage after moonset in the early hours of the morning of the 22nd of August. Soon after midnight the Russians switched on their searchlights, and it was evident that no part of the line was seriously threatened by immediate capture. From 2.30 a. m. the Japanese attack was developed with redoubled fury along the entire front of the center and left wing. The fighting was fiercest in the vicinity of the Panlung (Fortifications Nos. 1 and 2) and the lines of entanglements hedging in "P," "Q" (Caponier No. 2 and Kuropatkin Lunette), and North fort (Fort No. II). For the first time since the opening of the assault the attacks were pressed, but, meeting the decimating volleys of the concealed enemy, were beaten back at every point. Fresh troops were continually added to the firing line, and desperate efforts made to effect the capture of the Panlung (Fortifications Nos. 1 and 2); but insufficient lanes had been cut in the entanglements, and the troops were frightfully mauled

^a Seven and one-fourth miles from Port Arthur.

while cutting fresh paths through these obstacles. Luckily the cables of the mines were located and cut before use could be made of them by the garrison; but the devilish utility of the searchlights was again demonstrated by the skilful manner in which they were manipulated in locating the masses of Japanese for the general fire of the garrison. Despite the disadvantages, the attack was persistently pressed until 5 a. m., when, finding that no advantage had been obtained, the shattered columns were withdrawn to the cover of the many ravines and dongas running at right angles to the Russian line.

The First Division cooperated in the attack just before dawn, and were able to advance their firing line and cover the moving of the divisional artillery to the slopes about a mile to the north-west of I-tzu-shan (Fort No. IV).

The Japanese fleet was also in active cooperation throughout the night, lending support from off the south-east of Ta-ku-shan. Two battalions of reserves were dispatched to the ninth division at daylight, when the artillery immediately opened a heavy concentrated fire on the Paulungs (Fortifications Nos. 1 and 2), and, succeeding in squashing the Russian fire, enabled the broken battalions to re-form for continuing the night attack against these two fortifications. The 7th Regiment of the ninth division had been allotted the task of capturing the semi-permanents, and had been all night under arms striving to make some impression, but with no success. General Nogi, seriously reflecting upon the unexpected strength developed by the opposition, summoned a council of divisional commanders to headquarters to reconsider the plan of attack. During the absence of General Oshima (commanding the ninth division), the commander of the 7th Regiment, Colonel Ouchi, together with his battalion leaders and junior officers, forwarded a request to be allowed to immediately proceed with the attack on the Paulungs (Fortifications Nos. 1 and 2). Their wish being granted, the artillery redoubled its fire, and, when the belching mouths had smothered the defenses of the Slate Dragons with a deluge of shell and shrapnel, the gallant 7th attacked. With deliberate courage they worked up over the broken ground in a disjointed frontal attack, the companies cleverly converging on the position as if on manoeuvres. When a battalion or more had developed a strong firing line they were caught by a furious cross fire from East Paulung (Fortification No. 1) and North fort (Fort No. II). Volley after volley was poured into them from the enceinte wall, and the firing line literally mowed down by a sustained scythe of rifle fire, which quickly forced them to break ground and retire. It was now about eleven o'clock, and a small party of this daring force, stubbornly maintaining its position, effected a lodgment in the dip of ground between the East Paulung (Fortification No. 1) and "P" fortification (Caponier No. 2).^a

^a This shows clearly the existence of dead areas around the works.

This party then set about reconnoitring the position, and a volunteer, armed with a canister of dynamite, crawled up to the very breastworks of the redoubt, and, affixing the charge, managed to destroy one of the machine-gun shelters before being discovered and killed. This raised the hopes of the little party, and was repeated again with equal success. The rest of the regiment now renewed the attack and doubled back in squads of thirty and forty, making for the shelter of the depression, where the little party had established itself. Full two battalions reached this cover and overflowed the shelter it afforded. The Russians then brought a couple of machine guns to bear on them, and the force, smarting under the lash of this fire, wavered, and, breaking from the unfriendly shelter, were darting individually back over the glacis when an officer, reckless of life, leapt up from cover, dashed for the redoubt, and firmly planted the regimental colours before paying the penalty of his heroism. The effect of this self-sacrifice was momentous and dramatically tragical, for his lead was quickly followed by others, who kept the colours flying at the sacrifice of their lives. But the fluttering colours had been seen; the men ceased running, and joining the struggling mass of humanity, forced the standard nearer the redoubt. Bayonets flashed in the sunlight as the line of steel, not to be denied, surged over the breastworks and dashed at the waiting foe. A wild, bloody mêlée followed, and the cold steel of Japanese bayonets won the day as the fort changed hands. But it was not over. The garrisons in the West Panlung (Fortification No. 2) and North fort (Fort No. II) enfiladed the 7th Regiment in the captured works, who tenaciously held on, striving to re-create the defenses in the battered work, while the Japanese artillery, with increasing desperation, plied round after round into the forts. It was a critical time, and the 7th grimly waited with rapidly thinning ranks for relief. It came from an unexpected quarter. Two companies of reserves (detached to cover the operations of the 7th Regiment), seeing the dilemma of that force, asked for permission to attempt the capture of the West Panlung (Fortification No. 2), which at this time, set on fire by the Japanese shelling, was burning fiercely. The permission being obtained, these two companies made a spirited rush for the burning redoubt, and dashed into the flames. The suddenness of this daring attack threw the garrison into confusion, and the Japanese, making the utmost of the opportunity, were quickly masters of the situation.

This immediately relieved the tension on the 7th Regiment; but although it was now five o'clock, the dislodged garrisons, refusing to vacate the position altogether, maintained a heavy rifle fire on the lost works. But no human force or hellish agency was able to make the gallant 7th budge from their own. The slopes of the Panlungs (Fortifications Nos. 1 and 2) were like shambles, and the Russians continued to pour in hailstorms of shrapnel; but what had been won by the self-sacrificing devotion of one of the bravest regi-

ments that ever fixed bayonets was beyond recapture. At evening the 19th Regiment of the ninth division demonstrated against the Erhlung Lanette (Fort No. III), and under cover of the diversion supports were rushed up to the battalionless 7th. Under cover of darkness they were twice desperately counter-attacked by the Russians, and fierce fighting was necessary to maintain hold on the captured position. But a continual stream of supports was dribbled into the firing line, and the ground securely held despite frantic shelling and desperate assaults on the part of the ejected garrisons. A battalion of reserves was added to the command of General Oshima, and the night passed without further attempts being made to advance the general plan of assault. The way had been cleared to Wantai (Eagle Nest) at a terrible sacrifice, and the "division" that was to be sacrificed in the storming operation was almost already out of action. The spirit of the troops was excellent, and one and all were ready to double the sacrifice if the end could be brought in sight. But there were elements in the struggle that they could not eliminate by self-sacrifice, and, but for the national desire, the assault would most surely have been abandoned; but, as it was, the word had gone out, and Port Arthur was to be stormed at any price. So fierce was the fighting after the 20th that no attempts were made to benefit by the Geneva Convention and use the Red Cross flag. The wounded were allowed to lie for days under the blistering sun without succour, and left slowly to perish on the reeking, shambled slopes. Under cover of night rescue parties did go out to gather some of these unfortunate wounded, but, being forced to crawl over the ground, had to fasten ropes around the legs of the wounded and haul them over the uneven ground, thus inflicting terrible torture on the suffering and almost insane men. Men with just a spark of life in them were brought to the dressing stations with their bodies crawling with maggots from their decayed wounds; and scenes more horrible—but I refrain from further reference to the awful condition of the Japanese wounded.

From the foregoing quotation we see that General Nogi's plan was as follows:

1. To concentrate a strong artillery fire along the entire front of the fortress, but chiefly against the interval between Forts Nos. II and III.

2. To maintain this fire until our fortifications were destroyed and our artillery silenced, three days being considered sufficient for this purpose.

3. Simultaneously with the opening of fire, to begin a series of demonstrations against the north front and against the western and the extreme eastern flanks.

4. Under cover of these attacks and of the artillery fire, the division selected for the main attack was to occupy its

position and begin the attack when it should become evident that the Japanese artillery fire had accomplished its purpose.

5. The object of the main attack was to break through the line between Forts Nos. II and III, capturing the works in this interval, and to take possession of Eagle Nest.

6. Having thus divided the northeast front into two halves, to attack the intermediate batteries and Forts Nos. II and III from the rear, and fortify the captured positions.

7. By a final operation to drive the Russians behind the central enceinte and to storm the city.

The following measures were taken to execute this plan:

1. Three hundred siege guns were provided to destroy the Russian fortifications and silence their batteries.

2. A division was detailed to make each separate attack.

3. Each division had its divisional artillery to support its attack.

4. A strong reserve of six regiments under the direct control of the commander in chief was to support the main attack and strike the final blow.

5. The squadron was to support the attack by operating against the flanks.

6. The siege artillery was to fire against the forts, batteries, and intermediate fortifications.

7. Sappers were detailed to accompany the advance detachments to remove obstacles.

8. The movements of troops and the concentration of fire were controlled by an excellent telephone system connecting the batteries and the headquarters of the detachments with the observation stations.

The assailants were favored by the unfinished condition of the Russian fortifications and the fact that these works were absolutely unmasked, by the villages and gardens which had not been destroyed in the vicinity of the fortifications, and by the broken terrain and large dead spaces in the valley of the Lunhe and in the immediate vicinity of the works.

In order to give as full a picture of the battle as possible we give here the following official telephone messages:

1. To the Staff, Seventh Division, 7.40 a. m. August 19:

At 5 a. m. the Japanese began to fire from Fenghuangshan against Fort No. III and Fortifications Nos. 1 and 2.^a

^a The attack of 174-Meter Hill began at the same time.

2. To the Staff, Seventh Division, 11.05 a. m., August 19:

Redoubt No. 1 completely destroyed to-day by bombardment. All the guns except one damaged. Three bombproof shelters destroyed. Three men killed and twenty wounded. At Fort No. III all the large guns are damaged. Gorbatovski, General.

3. To the Chief of the Seventh Division, 7.35 p. m., August 19:

The commandant of Fortification No. 2, Captain Kruglik, reports ^a movements of troops in several columns in kaoliang and ravines in the direction of the village of Dapolichjuan. The cartridge magazine at Fort No. III has been set on fire by hostile shot.

4. To the Staff, 7.40 p. m., August 19:

At 7 p. m. attack by two or more Japanese battalions on Aqueduct Redoubt ceased.^c It appears that the assault has been repulsed by the aid of the artillery. The situation of the company is critical. The Japanese have taken the ditch and surround the redoubt. Can the company retreat? Semenhoff, Colonel.^c

5. To Colonel Semenhoff, 7.50 p. m., August 19:

It is not possible to retreat from Aqueduct Redoubt. Send two batteries of field artillery to fire against the approaches to the redoubt. Smirnov, Lieutenant General.

6. To the Commandant of the Fortress, 6.15 p. m., August 19:

Shelters of Aqueduct Redoubt are entirely destroyed according to the report of the company commander, and the men are firing above the shelters. Two companies have been sent as reinforcements.

7. To the Commandant of the Fortress, 6.15 p. m., August 20:

The enemy is firing furiously against the two fortifications, especially against No. 1 and the batteries connected with it. At this moment breaches are being made in the Chinese wall. Field artillery is to be seen in the kaoliang and in rear of it considerable detachments of infantry. I believe that the enemy will attack the fortification to-day. Gorbatovski, Major General.

^a In addition to this report on the movements of the enemy there was another from the armored observation station on Rocky Hill close to Fort No. III.

^b Demonstration against the northern front. These movements were not seen from Forts Nos. II and III.

^c This message, as well as messages 6 and 8, shows clearly the expediency of filling in the intervals between the forts with temporary fortifications so easily destroyed.

8. To Major General Gorbatovski, August 21:

All the men who have been sent to the entrenchments of Fortification No. 1 have been killed. Impossible to hold out. We are awaiting orders. Sokolovski, Fourteenth East-Siberian Rifles, and Krivoruchenko, Captain, Sixteenth East-Siberian Rifles.

In forwarding this report to the fortress staff, I wish to add that all the local reserves have been exhausted and that I can send no help to the fortifications. Gorbatovski, Major General.

9. August 21:

The valley in the vicinity of the new magazine is under heavy fire. The reserves will be worn out by night if kept under fire all day. General Fock.

10. To the Commandant of the Fortress, 4.40 a. m., August 21:

The enemy is attacking the east front, the first shots having been heard at 4 a. m. Main attack appears to be directed against the two fortifications. Gorbatovski, Major General.

11. To the Commandant of the Fortress, 8.40 a. m., August 21:

It is apparent that the enemy is advancing in great force between Forts Nos. II and III. The lack of artillery and of bombproofs renders the situation very trying. The reserves are being exhausted, only four companies remaining. The men are firm, but suffer terribly from shell, shrapnel, and machine gun fire, Gorbatovski, Major General.

12. At 9.15 a. m., August 21:

The lack of artillery renders the situation very dangerous. I earnestly request you to support us with field batteries. Gorbatovski, Major General.

13. At 9.45 a. m., August 21:

The ranks are thinning with frightful rapidity. Am expending my last reserves. Gorbatovski.

14. From Fort No. I to General Smirnof at 10.40 a. m., August 21:

The enemy is crossing the valley through which railway passes, and moving partly against the left flank of the Third Company, Twenty-fifth Regiment, but chiefly against Dapalichwan, Fort No. I is under fire. Artillery should fire against closed columns. They are preparing to assault. The reserve must be brought closer. Stoesel.

15. To the Commandant of the Fortress, 11 a. m., August 21:

I consider situation very serious. The forts and redoubts are all destroyed, and an enormous number of the defenders are hors de

combat. The artillery is silenced. The small guns are almost all damaged, the reserves are exhausted, and help is demanded on all sides. There are companies without a man in ranks. The present lull in the firing indicates preparation and concentration of the enemy to storm. Gorbatovski, Major General.

I have read the report. If they break through a general reserve must be formed and all the marines must be brought from the trenches. Stoessel, Lieutenant General.

16. To General Fock, 12 noon, August 21:

I would request that you give instructions for the advance of two battalions of the Fourteenth Regiment to Magazine A in the valley between Great Hill and the works. Smirnoff, Major General.

17. To the Commandant of the Fortress, 12.25 p. m., August 21:

Instructions for the advance of two battalions to the reserve were given by me immediately upon receipt of your order. I deem it my duty to report that the point to which the reserve has been ordered has been under shrapnel fire throughout the entire night. I likewise expect the Japanese to attack during the night, hence I would like to have fresh and not worn out reserves. At the present moment the Japanese are acting strictly according to the precept of Sauer. The reserves of General Gorbatovski are sufficient to serve as a bait for them. Fock, Major General.

18. To the Commandant of the Fortress, 4.45 p. m., August 21:

The situation is unchanged; it is not worse. Unfortunately I must report that four rapid-fire guns, which were being taken to Kuropatkin Lunette, did not reach their destination, having fallen under strong shell fire. There is a telephone station here; the line is broken; it has been repaired several times; but is again out of order. After dark we will do all we can to place the guns in position. The enemy concentrated against the fortifications in great force at a distance between 200 and 600 paces from them, especially against No. 1. Gorbatovski, Major General.

19. To the Commandant of the Fortress, 5.10 a. m., August 22:

At 3.30 a. m. hot firing took place near Fortification No. 1; at the present moment the enemy is pouring shrapnel into it. Gorbatovski, Major General.

20. To the Commandant of the Fortress, 6 a. m., August 22:

The enemy is firing everywhere with shrapnel and at Fortification No. 1 with small arms. Two companies of the Fourteenth Regiment, which I held as local reserves, have been sent, at the request of Gen-

eral Fock, to join the general reserve. In addition to the marines, I have only one company of rifles, which was sent to B on account of the precarious condition of affairs at that point. Do not comprehend movement of enemy's troops. Gorbatovski, Major General.

21. To the Commandant of the Fortress, 9.20 a. m., August 22:

There are small parties of the enemy in folds in the ground in front of the fortifications firing against the fortifications. Along the entire line the enemy is firing slowly with shrapnel and shell. Gorbatovski, Major General.

22. To the Commandant of the Fortress, 11.25 a. m., August 22:

At 10.30 a. m. the enemy concentrated all his artillery fire on Fortifications Nos. 1 and 2 and sent several columns to the attack. He drove the weak garrison out of No. 1, but could not hold it long. Our rifles retook it and were in their turn supported by all the marine companies. At this moment the fortification is in our hands, but is again under hot artillery fire. We are answering with mortars and two rapid-fire guns. I wish to testify to the courage of the marines and rifles. The combat continues, and the reserves are exhausted with the exception of one battalion of the Fourteenth Regiment. Gorbatovski, Major General.

23. To Lieutenant Colonel Poklad, from Fort No. II, at 12.20 p. m., August 22:

The fort has no defenders. Only forty men are left. All the guns and two machine guns are damaged and the breastworks are destroyed. The hostile artillery is firing against the fort from the land; also from the sea with high-explosive shell. Infantry in large numbers is concealed in the nearest ravines. Kwatz, Second Captain.

In forwarding this report to his excellency Major General Gorbatovski, I have the honor to report that I have no reserve. Pushkar-ski, Lieutenant Colonel.

24. To the Commandant of the Fortress, 1 p. m., August 22:

I have no reserve. All is expended. There remains only a half company of marines. The loss in officers is great. Fortification No. 1 has four times changed hands. At this moment one part of it is occupied by our men and the other by the Japanese. Both fortifications are under a terrific fire, and the men begin to show fatigue. The loss in the rank and file is likewise great. Gorbatovski, Major General.

25. To the Commandant of the Fortress, 1.40 p. m., August 22:

The losses are enormous in the rank and file and among the officers. I have no reserve. The smallest effort on the part of the Japanese

may result in their breaking through even to the Chinese wall, for we have no one to defend it. I earnestly request you to place a reserve at my disposition. Gorbatovski, Major General.

26. To the Staff from Tooth Battery, 1.45 p. m., August 22:

We have nobody for observation. All the officers are wounded. The chief of group-sectors is bruised and wounded. Send an officer for observation.

27. To the Commandant of the Fortress, 4.30 p. m., August 22:

I report to your excellency that the condition of affairs is critical. After the combat there remained in each unit only a few men almost without officers. Although the fortifications may be considered to be in our hands, we have in fact no men to occupy them, for we have no companies either in the fighting line or in the reserve except pitiful remnants and three companies of the Fourteenth Regiment. With such poor remains which have not yet been re-formed in an orderly manner, it will be impossible to withstand even the weakest attack, which may be expected at any moment. I do not consider it possible for me to leave my position for personal report to your excellency. Hence I beg of you that you would either find it convenient to come up to Rocky Ridge, where I deem your presence indispensable on the field of battle, or give me permission to report to you. Gorbatovski, Major General.

28. To the Commandant of the Fortress, August 22:

I have to report that Fortifications No. 1 and No. 2 are in the hands of the Japanese. They are therefore near the Chinese Wall. In the interior of the position men are falling, and the weak remnants of the defenders are melting away every hour. I consider defense impossible, not only with what remains, but with much greater forces. Until the fortifications are retaken the Japanese may be expected to break through at any moment. Gorbatovski, Major General.

29. To the Commandant of the Fortress, August 22:

Fortifications Nos. 1 and 2 are evacuated. Our men have retreated beyond the Chinese wall. They were driven out by a strong artillery cross fire. Almost all the defenders were killed, and the Japanese occupied the fortifications. Six times our forces were sent to retake the fortifications and recaptured them, but the Japanese again killed off the defenders by a hotter fire. It is impossible to keep the fortifications. Fort No. III holds out, but there are only forty men in it. The Japanese are in considerable numbers under the glacis. Prepared scaling ladders may be seen. It is evident that the fort is going to be stormed to-night. All the guns in the fort are

damaged. The men at the machine guns are all killed, and there is nobody to fire them. Poklad, Colonel.

30. To the Staff of the Fortress, 6.05 p. m., August 22:

The Aqueduct Redoubt reports that Fortification No. 2 is occupied by two battalions of Japanese. Fort No. II is not occupied, but there are about three Japanese regiments near the breastworks, and in their rear reinforcements may be seen. Seminoff, Colonel.

31. To the Chief of Staff, 6.16 p. m., August 22:

The battalion of the Fourteenth Regiment holds the defile near the magazine.^a Dmitrevski, colonel.

On the morning of August 19 the Japanese opened a vigorous artillery fire against the principal point of attack, the interval between Forts Nos. II and III, and the adjacent communications. In order to mask their intentions, they opened a heavy fire against the rest of the line and against the city and began to storm 174-Meter Hill and the north-west front. To capture the intermediate fortifications, the dismantling of the forts and the silencing of their artillery was a necessary preliminary. Deprived of the support of the forts, isolated and greatly damaged by a strong hostile fire, these fortifications could hardly offer serious resistance. This result was all the more probable as these fortifications were old transformed Chinese works without outer ditches. The Japanese plan in regard to the intermediate fortifications was not without excellent foundation, however senseless was their attempt to take Fort No. II by open assault.

Having given a general view of the great assault, we shall now examine it in detail in order to obtain instructive data which will serve as a basis for comment upon desirable changes in the theory of fortress defense in general and the construction of forts and smaller works in particular.

The demonstrations against the north and northwest fronts were successful in that they led us to believe that these fronts were the objects of the main attack and caused us to send the major part of our reserve to reinforce them with General Kondratchenko at its head. This end was attained by bringing as strong a fire against these fronts as against the real points to be attacked and by the simultaneous ap-

^a Alas, it came too late. This shows clearly the necessity of having shelter for the troops near the fighting line.

pearance of the storming columns of the First Division. The movements of the other divisions were more concealed and were not discovered so soon.

The artillery fire concentrated against Forts Nos. II and III was so strong in the afternoon of the first day that their artillery was silenced as reported in message No. 2, as was also the fire of some of the other batteries. This was due in part to damage done to the guns, but mainly to the fact that the personnel could not serve the guns placed in full view of the enemy and fired at from all sides. The success of the Japanese was due to the unwise location of our guns. The fire, which was begun in the morning, was continued until 6 p. m. About 2,400 projectiles were fired at Fort No. III, at the rate of 200 per hour or $3\frac{1}{3}$ per minute. At Battery B 600 six-inch projectiles fell, being at the rate of one projectile per minute. The number of large-caliber projectiles was one-third or one-fourth the number of smaller projectiles from mountain and field guns. Hence the batteries received as many projectiles as the forts—that is, three or four per minute. Half of the projectiles were percussion shells, the rest shrapnel. The destruction of the forts and batteries proceeded simultaneously with the destruction of the men exposed in the open. It was impossible to serve the guns continuously under such a fire without having all of the gunners killed in one day. Some of the batteries therefore fired at great intervals, while the forts and certain batteries were quite silent,^a the gunners remaining in the shelters and casemates.

The garrisons of the forts had been concentrated since morning in the gorge casemates. There was one armored tower with a cupola for observation at Fort No. III, on the left flank of the 6-inch gun battery. This cupola was constructed of iron five-eighths of an inch thick, upon a stone foundation bedded in cement on the parapet of the battery, commanding it only by 6 feet. An artilleryman observed the hostile fire and the movements of the hostile troops from this post: but it was impossible to observe the movements of the enemy in the immediate vicinity of the forts, as

^a The artillerymen now began to speak about the desirability of having shields at the guns for protection against shrapnel.

the battery on which the tower was situated was in the interior of the fort. In order to observe the approaches to the forts and the intervals, volunteers went out upon the parapets of the fort. They hid in rear of the traverses and observed through the embrasures under cover of the shrapnel screens. But the fire was so strong that three of the five volunteers were put hors de combat before noon. Then the number of volunteers decreased markedly, and it may be said that, beginning with noon of August 19, observation from the forts was very unsatisfactory. Generally it was possible only during short intervals of five to ten minutes, when the enemy's fire slackened for some reason. Corporal Yakimoff, Private Chaplinski of the Rifles, and two or three others then jumped to the breastworks and observed the terrain around the fort.

While the garrisons of the forts sought shelter in the casemates from the artillery fire, the Japanese division detailed for the assault advanced one by one, in Indian file, in small groups through the ravines, the thick kaoliang, and ditches, and occupied the nearest villages, ready for assault. We saw nothing of this, knew nothing, suspected nothing. None of the observation stations discovered the advance of the Japanese on August 19 and 20. This subdued condition of the garrison, forced to hide deep in the interior of the casemates, continued during the remaining days of the bombardment, and when, on August 22, the Japanese approached Fortifications Nos. 1 and 2 and began to storm them, increasing the fire against the forts, all observation at the forts had ceased. This is why the garrisons of the forts not only did not support the intervals, but did not know when the fortifications were taken.

We were greatly astonished in the fort at a distance of 500 paces from the captured works when the chief of the detachment sent us a note ordering us to open fire against our own fortification. Thinking it a mistake, the commandant sent for an explanation. Alas, it soon came!

The interval between Forts Nos. II and III was thus deprived of support by rifle fire from the two forts by an uninterrupted artillery fire against the forts. This fire deprived us of both eyes and hands. We conclude that it is absolutely necessary to provide forts with means to observe

without interruption and to support the intervals at the proper time under the heaviest artillery fire. The first object may be attained by the erection of several armored observation towers at various points about the fort; the second, by the erection along the parapets of concrete galleries with loopholes for small arms or by several turrets for machine guns. We wish to emphasize our conviction that forts will not support the intervals between them if the riflemen when firing are without secure shelter against shrapnel and shell fragments. With a few slight alterations I believe that the galleries for infantry, proposed by Col. A. P. Sho-hin would answer this purpose.

• INTERMEDIATE REAR CAPONIERS.

The irrational construction of open-gorge caponiers at Forts Nos. II and III, and their faulty disposition rendered them useless as intermediate rear caponiers for flanking fire on the adjacent intervals. The assault of August 22, that which took place on the night of August 23-24, together with the following considerations, clearly show the value of these caponiers if well placed and properly constructed. In constructing them it is desirable to place the embrasures so as to be able to direct the fire against the glacis in rear of the fort to which they belong, and also against the glacis of the neighboring forts some 1,200 to 1,400 yards distant. Thus constructed rear caponiers may assist the forts until the last moment and the dead space in the interval will be negligible.

In speaking of the great importance of rear caponiers, we revert instinctively to the assault on the Chinese wall during the night of August 23-24, and the important work which fell to the lot of Fort No. III upon its right flank in repulsing this assault. The fact is that, on account of the unfinished state of the fort, instead of there being traverses to cover the angle of the gorge from fire from the front, there were large heaps of earth covering completely the two guns which were to be used in repulsing assault, one a field gun in the angle, the other a 37-mm. gun on a platform. When, during the night of August 23-24, the Japanese began to advance from Fortifications Nos. 1 and 2 to the Chinese wall, the commandant of the fort ordered the nearest searchlight to direct its beam upon them and the battery commander opened

fire from the machine guns, two field guns, one 37-mm. gun, and the 37-mm. gun of the gorge caponier. This fire at very short range was very deadly. General Kondratchenko stated that the fort destroyed about 3,000 Japanese.

It will readily be understood that such effective support of the interval could only be given because, on account of the darkness, the Japanese could not concentrate a strong artillery fire against the fort, and thus beat down its fire. During all the next day's assaults on the works in the vicinity of the fort, our artillery intended to oppose assault operated very feebly. Taking advantage of the unfinished condition of the gorge ditch, at the angles of which the depth was only $3\frac{1}{2}$ feet, we prepared the gorge caponier of the fort as a rear caponier and fired from it on the glacis of Redoubt No. 3 and Fortification No. 2 with the 37-mm. guns. This defense of the intervals and of the neighboring fortifications was primitive, but it caused so much havoc to the Japanese that they determined to destroy the caponier. For this purpose they fired upon it for a long time with 11-inch shells from both sides and succeeded in breaching the left face wall. Not until December 28 did they succeed in damaging the right face wall and destroying the embrasures. But Captain Dobroff, of the Engineers, succeeded in removing the fallen mass of earth by breaking it up under the hottest fire with small charges of pyroxilin. These examples show the advantages of firing against the intervals from well constructed caponiers and how baneful they are to the attack.

While basing the defense of the intervals upon the principle of mutual support from the flanks of forts and rear caponiers, it is wrong to construct rear caponiers only. The siege showed the great importance of small, open caponiers, constructed to the right and left of the forts. The fact is that there will always be some ravine or ditch in front of a fort suited to the enemy's purposes which it will be impossible to fill and difficult to cover with fire from other forts at long range. If the terrain will permit, open intermediate caponiers should be constructed at short distances from such ditches. The importance of such works is shown by the history of Caponier No. 3. About 200 paces to the right of Fort No. III, on a level with its end face, was a small height, separated from the fort by a deep ditch. Observing that

the nearest approaches to the fort could be covered by fire from this height, I scarped its rear slope and constructed emplacements for two field guns. One of them was for the support of the fort; the other for the support of Fortification No. 2. The battery was protected in front by infantry entrenchments and a wire entanglement. According to reports of eye-witnesses during the storming of Fortification No. 2 on August 22, the caponier, firing one gun to the right, did much damage to the Japanese and prevented them from turning the fortification by the left. It likewise prevented the Japanese from attacking Fort No. III. In its turn, being near the fort, it was always supported by the fire of the fort. In order to capture it, the Japanese had to undertake siege operations lasting one and one-half months. Only after having taken this caponier, which, after all, was merely a temporary field work, did the Japanese begin the nearer approaches to Fort No. III.

CHAPTER V.

(See Plates I, II, III, and VIII.)

LENGTH OF THE INTERVALS BETWEEN FORTS—FILLING IN THE INTERVALS BETWEEN FORTS AND THE RÔLE OF THE CENTRAL ENCEINTE—BOMBPROOF SHELTERS FOR THE GARRISONS OF THE INTERVALS—MASKING OF THE DEFENSES.

The examination of plans of various fortresses, Russian and foreign, shows us that the intervals between forts vary greatly, not only in different fortresses, but even in the same fortress. Generally they vary, according to the terrain, between $1\frac{1}{3}$ and $2\frac{2}{3}$ miles, although in some forts there are intervals of $3\frac{1}{3}$, 4, $4\frac{2}{3}$, and even $5\frac{1}{3}$ miles. Hence the question, What distance ought to be accepted as the normal? It may be that a distance of $1\frac{1}{3}$ miles is too small and $5\frac{1}{3}$ miles should be taken. Perhaps $5\frac{1}{3}$ miles is too great and $1\frac{1}{3}$ miles is correct: or perhaps an interval of $2\frac{2}{3}$ to $3\frac{1}{3}$ miles should be adopted.

Let us return to the plan of the fortress of Port Arthur. The intervals between the forts were as follows:

	Mile.
1. From Coast Battery No. 22 to Fort No. I.....	1
2. From Fort No. I to Fort No. II.....	$2\frac{2}{3}$
3. From Fort No. II to Fort No. III.....	$1\frac{1}{3}$
4. From Fort No. III to Fort No. IV.....	$2\frac{1}{4}$
5. From Fort No. IV to Fort No. V.....	2
6. From Fort No. V to site for Fort No. VI.....	$3\frac{1}{4}$

The intervals varied here between 1 and $3\frac{1}{4}$ miles.

The principal attack was directed against the interval between Forts Nos. II and III. As compared to other intervals it was almost the strongest as regards fortifications on account of the defensive parapet constructed by the Chinese, known as the Chinese wall. Forts Nos. II and III were on heights somewhat advanced from Dragon Ridge. Between the forts were four heights separated from each other by deep ravines, the two central heights being higher than the other two. They were almost equal in height to Fort No. II and somewhat higher than Fort No. III. Works constructed on these heights by the Chinese and

transformed by us into fortifications of high profile almost entirely concealed the forts from each other. As the forts were not visible from each other, they could not give each other mutual support. The sites for the forts were well chosen, but in filling in the interval between them the necessity for mutual support should have received more consideration. In place of Fortifications Nos. 1 and 2, permanent works should have been constructed capable of filling the gap and supporting the forts.

The early capture of Fortifications Nos. 1 and 2 does not allow us to say how far they might have fulfilled this object. We can give the following facts in regard to cases where forts supported works in adjacent intervals:

1. Fort No. III often supported very effectively the neighboring works, Redoubt No. 3 and Caponier No. 3, distant 459 paces.^a It supported the Aqueduct Redoubt and Idol Redoubt very feebly at a distance of 2,550 paces.

2. Fort No. II supported Caponier No. 2, distant 450 paces; and Kuropatkin Lunette, distant 350 paces. Its aid was ineffective at greater distances.

3. Redoubt No. 3 supported Fort No. III at a distance of 300 paces and, with its artillery fire, the Aqueduct Redoubt at a distance of $1\frac{1}{3}$ miles.

4. Fort No. IV effectively supported Redoubt No. 3 with fire from its 75-mm. naval guns at a distance of $1\frac{2}{3}$ miles.

5. Redoubt No. 3 and the Mound Battery were supported effectively from the trenches on Cossack Place with rifle and artillery fire at a distance of 1,500 paces.

6. Kuropatkin Lunette supported Battery B with rifle fire at a distance of 600 paces.

7. The Liaotesan position supported 203-Meter Hill with 6-inch Canet guns at a distance of 4 miles, but only in the daytime.

Thus we see that mutual support by rifle fire was effective at a distance of 600 paces in broken ground and 1,500 paces in open ground. During night attacks support was given at almost equal ranges; for, with a searchlight 24 in. in diameter, targets were clearly visible at ranges from 600 to 800 paces, and with a searchlight 30 to 36 in. in diameter

^a The Russian pace = 28 inches, or $2\frac{1}{3}$ feet.—Tr.

the target was visible at distances from 1,200 to 1,500 paces. After much discussion we came to the conclusion at Port Arthur that the final rôle in the repulse of an attack fell always to the infantry, the rôle of the artillery being secondary. This was due to the fact that the assailants approached the works by single files and small groups and not in column. Under such conditions shrapnel is of no avail, while rifle fire and bayonets are decisive. Rapid-fire artillery has undoubtedly been and will be of great advantage, but only at distances where small groups of men are clearly visible to the commander and pointer.

We think that the principal line of defense of modern fortresses—the line of forts—may be compared to the enceintes of the old fortresses. During the period of stone ramparts the rôle of the forts was played by the towers, erected at a distance of twice the flight of an arrow, flanking the approaches to the forts. With earthen ramparts this rôle was played by the bastions. The distance between them was determined by the range of case shot. But these ranges did not exceed the limit of the vision of men. Hence the distances between towers and bastions depended in no way upon the question of the visibility of the target. The range of the gun is no longer the controlling factor. Everything depends upon visual power. The defense of the intervals can not, therefore, be based only upon shrapnel fire from rear ditch caponiers. In determining the distances between forts we must be guided not by the range of artillery, but by the ability of man to see clearly by day, and by night with the aid of searchlights. Assuming that, with a searchlight 30 to 36 in. in diameter, an effective fire can be maintained at ranges from 1,000 to 1,500 paces, we see that intervals should not exceed 3,000 paces, or 7,000 feet—1 $\frac{1}{3}$ miles. With such intervals each fort should have the support of rifle fire from intermediate works and of artillery fire from the rear caponiers of the neighboring forts. During the day neighboring forts will be able to support each other with rifle fire.

In locating forts and redoubts we must therefore be guided by the following rules:

1. The forts and redoubts should be clearly visible from each other by day and also during the night with the aid of searchlights.

2. The distance between them should be such that mutual support may be given with rifle fire both by day and by night.

3. If there is to be a permanent redoubt between the forts, the distance between the forts must not exceed $1\frac{1}{2}$ miles.

4. In case no intermediate redoubts are to be built the distance between the forts must not exceed two-thirds of a mile.

FILLING IN THE INTERVALS BETWEEN FORTS AND THE RÔLE OF THE CENTRAL ENCEINTE.

After the siege of Sebastopol the plan of fortresses was changed from a closed polygon into a circle of scattered independent fortifications. The time-honored principle of the closed work was cast aside. For the stubborn defense of a separate work, it has always been held that it should be closed. The same principle applied for ages to the fortress. In the decade which followed Sebastopol this eternal principle was diregarded, and fortresses were constructed consisting of from ten to twelve separate works with intervals between them somewhat like wide gates in the interior of the old fortress. But the principle of the closed work was founded too deeply to be rejected so easily. It was now agreed that the intervals should be fortified during mobilization with entrenchments and other temporary works. But as these were to be constructed only at the beginning of military operations, it was decided to maintain the central enceintes in the old fortresses for defense against sudden attack, and to construct enceintes in new fortresses.

The object of the enceinte was to protect the stores and magazines. For this purpose permanent works were constructed, but for the security of the fighting line temporary works were deemed sufficient, as though the vital parts of a fortress were the stores of powder and other supplies, and not the line of forts and batteries, against the capture of which by sudden attack no steps were taken in time of peace. Hence we see that the principle of the closed work was not entirely discarded, but it was altered in its application. It was retained where it was not vitally necessary and rejected where it was absolutely indispensable.

It is, indeed, difficult to see why the center of the fortress, with its magazines and offices, is the vital part: it is difficult

to comprehend the reasoning of those who regard the capture of the supplies as a fatality and the capture of two or three forts as a secondary matter. The fall of the forts seals the fate of the fortress, however great may be the quantity of supplies within the enceinte. The supreme efforts of the defense should be concentrated not upon the defenses in rear, but upon the fighting line. We see, however, that the exactly opposite rule has been followed, as a result of financial considerations. It was thought permanent works for the defense of the intervals would cost too much, and that this defense could be provided for by cross fire from the forts and intermediate works, supplemented by the frontal fire from entrenchments. During the last fifty years those who have planned and built fortresses have been guided by these considerations. Such views prevailed in the construction of all modern fortresses, including that of Port Arthur.

During the last twenty years a few voices have been raised in protest. Two plans have been suggested: The first, to reconcile the principle of the closed work with economic conditions by constructing permanent, continuous parapets and concrete casemates; the second, to construct separate permanent works in the intervals. Both propositions were made by Russian engineers in 1890; the first by Colonel Velichko, the second by Lieutenant Colonel Prussak. Both projects caused heated discussions; they were defended by some and attacked by others. An interchange of opinions took place in the *Engineering Journal* and thus the matter ended. In the higher engineering spheres these projects did not receive special notice and they were never tried. To illustrate the effect which the adoption of these projects would have had upon the defense of Port Arthur, let us take the assaults of the 22d of August and of the night of the 23d and 24th of the same month. It has been made clear that the interval between Forts Nos. II and III had a parapet connecting the gorges of these forts. On heights in front of this parapet, at distances between 300 and 400 paces, were four works absolutely independent of each other. During the assault of August 22 the two central works, Fortifications Nos. 1 and 2, fell into the hands of the enemy. Their capture was due, leaving aside consideration of their extremely unsatisfactory condition for defense, to

the lack of support from the forts on account of the advanced positions of the fortifications and to the lack of sustained communication with the forts. The two other works, Caponiers Nos. 2 and 3, remained in our hands only on account of their proximity to the forts. Having taken the central works, the Japanese decided to finish their operations against that front by breaking through the intrenchments, capturing Eagle Nest, attacking the forts and intermediate batteries from the rear, and storming the city. The sortie during the night for the recapture of the lost fortifications frustrated the Japanese plan, but, in itself, was unsuccessful. As soon as it was over the Japanese endeavored to take the offensive again and advance against the enceinte.

The English correspondent, David James, writes as follows:

On the morning of the 23rd of August the remnants of the 7th Regiment sallied out from the East Panlung (Fortification No. 1) and worked up toward Wantai (Eagle Nest). They were unmercifully handled, and had to crouch in shell holes for cover, where they lay all day, monuments of plucky determination carried too far.^a

It must be inferred that this sortie was nothing but a reconnaissance of the enceinte. On the following night the Japanese stormed it. The assault is described by Mr. James as follows:

They had penetrated deeply into the heart of the enemy's territory; the thin edge of a wedge that could not be hammered in. Through the day, on account of a lack of ammunition, the Japanese artillery were strangely inactive, and apart from the action of the 7th Regiment, there was no infantry work. Meanwhile the plan of the Japanese commander dawned upon the defenders, and they were not slow to act, for General Krondrachenko planned a counter-move, which, though not successfully carried out in detail, frustrated the rush tactics of the Japanese and held them in check for many months. The inactivity of the Japanese on the 23rd allowed ample time for developing these plans. Briefly stated, the idea was to counter attack the Japanese before they got their battalions moving for the great assault, and then, after throwing the Japanese lines into disorder, retire and contest the ground in front of the position the Japanese were intending to assault. The sortie was to move out in three columns, one from the direction of "Q" fortification (Kuropatkin Lunette), a second from the Ehrlung fort (Fort No. III), and

^a James, p. 90.

the third central column from Wantai (Eagle Nest). It will be seen later how this was carried out, and in what details it failed.

* * * * *

As it was evident that the great assault would take definite shape that night, a couple of us (deciding to join the actual firing line), in the singularly quiet evening that passed, slipped out of camp unnoticed. It was then a little after eleven o'clock, and hardly had we got clear of Feng-hwang-shan than a faint rattling of rifle fire came from the foot of Wantai (Eagle Nest). No less than seven searchlights were flashing from the fortifications, and three of these converged on the Panlungs (Fortifications Nos. 1 and 2). The rifle fire steadily increased, and the quiet searchlights swung down to where the regiments of the ninth and eleventh divisions were waiting to attack. A few minutes later the rays of light commenced working up and down the slopes of the Panlungs (Fortifications Nos. 1 and 2), and Russian rifle fire working down the slope of Wantai (Eagle Nest) could be distinctly heard above the general rattle of musketry. The Japanese reserved their fire for a few minutes, and the Russians, continuing their unchecked advance behind the rays of the searchlights, quickly drove the wasted remnants of the 7th Regiment into the East Panlung (Fortification No. 1). Then the Japanese opened up with a sickening burr of musketry, which momentarily halted the Russians. Supported by a heavy machine gun and artillery fire from "Q" fortification (Kuropatkin Lunette), the wings of the sortie now joined the center, and working up a heavy fire bore down on the Panlungs (Fortifications Nos. 1 and 2). Star-shells bursting in rapid confusion over the Japanese troops aided in the work of the sortie and hampered the movements of the Japanese. Beneath the Panlungs the main body of the besiegers were gathered, waiting to make their attack, and these quickly developed a firing line and joined issue with the garrisons of the Panlungs. The Russian force now split up into two bodies and attempted to carry out Krondrachenko's plan of enveloping the lost semi-permanents. One force made a desperate attempt to descend to the west of the West Panlung (Fortification No. 2), while the other made an equally determined effort to work down between the East Panlung (Fortification No. 1) and north fort (Fort No. II). Their object was to join forces between the two Panlungs, and then, by falling back on them, annihilate the garrisons and effect a recapture. Here the sortie failed, for the main body of Japanese were now well up and pouring in a hot fire upon them; and the two Russian forces, forced to give way, retired to the enceinte, where, supported by the fire from all the fortifications in the neighbourhood, they made a determined stand. Volley now answered volley, and all the seven searchlights were busy flashing in the faces of the Japanese infantry. A regular fury of firing filled the air as the Japanese assumed the offensive and attacked the enceinte beneath Wantai. The firing remained stationary for a while until the Japanese brought up their machine guns and quick-firers and commenced pounding

away at the cleverly hidden counterparts of the enemy. Then a double purring of machine guns and a double edition of terror-striking pom-pomming was heard above the continuous roar of musketry. The awful hissing of bullets, the bewildering fury of the volleys, the thrilling play of machine guns, and the hum of human cries all sounded in the distance like the rush of a hurricane through a leafy forest. And when this medley of noises had merged into a monotonous screech, high above the awful battle noise came the thrilling sound of soldiers' voices raised in soldiers' cheers. Three long Banzais then busied the hills with echoes, and announced the fact that the Russians were breaking ground and retiring. Slowly they retired, helped back to their lines by the dazzling glare of the silent searchlights and the noisy, wicked deviltry of the concealed machine guns.

The Japanese were, however, smartly held at the enceinte, and for a time their advance stopped by cross fire from the batteries on either flank of Wantai (Eagle Nest). This moment was selected by the tenth brigade of the eleventh division for making an attack on "Q" fortification (Kuropatkin Lunette) to create a diversion in favour of the troops halted at the enceinte. They had scarcely got moving before they were unmasked by star-shells, and under the glare of a couple of searchlights subjected to a terrific fire from the Keekwan south fort (Battery B) and west battery, and this, coupled with the fire of "Q" (Kuropatkin Lunette), soon broke up their attack.^a

Further he says:

From now on—although the only probable result of continuing the unprotected assault in full sight of a concealed enemy was a repulse—the general assault was vigorously developed and became intensely impressive, for a wonderful scene was now enacted. General Nogi's plans—delayed by the sortie—were now set in motion, and the ninth and eleventh divisions made the attempt to drive in the wedge and reach the summit of Wantai (Eagle Nest). Against almost unprecedented methods of warfare and unpamable odds, the Japanese infantry, displaying most wonderful courage, went steadfastly to work, to do or die. Isolated bands gained footing and crouched in agonising suspense, waiting to gather enough force to warrant a rush for the trenches, and in their isolation were found by the light of star-shells and pounced on by the glaring searchlight for the decimating fire of hidden machine guns and riflemen. Some, heedless of life, by strenuous bravery gained the trenches, only to be riddled by bullets and clubbed by rifles. It was cruelly impressive to listen in the cool of the morning to the shrieking shell, tapping of pom-poms, and whirls of machine gun fire, to see in the grim darkness the flashes of artillery and the sparks of rifles, and the pale flickering of particles of star-shells and the dazzling glare of searchlights, and to know that it

was all slaughter, a butchery of willing men vainly massacred for the sake of a national sentiment that could not wait for revenge. Dawn was long, long in coming, and the fighting slowly, so slowly, subsided, like a disappointed child sobbing itself to sleep. Six hours of carnage were over, and those who watched and did not fight could but imagine what had happened. Soon over the scene of strife came the blood-red beams of the rising sun, struggling through the morning mist heavily laden with drifting smoke, and ere it cleared the Japanese artillery screeched out in wild defiance and ushered in another day of carnage. The great assault was over, the great assault that failed, and the wonderful concentrated artillery fire that followed was but the aftermath.

Quickly working from either end of the eastern fort ridge, the artillery fire met midway in the line at Wantai above the Panlungs, which were now covered with clouds of shrapnel from the Russian artillery, which had early responded to the Japanese fire. The concentrated fire worked backwards and forwards along the whole line, until, in an hour, so accurate was the shelling that the line of eastern fortifications were smothered in clouds of earth and smoke raised by the bursting shells. The preponderance of Japanese fire early made itself felt, and by the devastation of this terrible cannonade the Russian gunners were overpowered and silenced, for it was the result of the fifteen days' range-finding practice of their enemy. Under cover of this artillery fire the Japanese infantry made a last attempt to reach Wantai (Eagle Nest), but, directly they got moving, the Russian guns in the west opened a heavy shell fire which crushed the life out of the attack, and forced the responsible commanders to realize the hopelessness of persisting in the assault; and the Japanese, beaten, but by no means defeated, retired beyond the enceinte, and were only able to claim, as the result of four days' continual fighting, the two semi-permanents of Panlung (Fortifications Nos. 1 and 2).^a

These descriptions, however, do not give a complete picture of the storming.

The affair was in reality as follows:

About 10 p. m. on August 23 the Japanese began to assault the entire east front from Fort No. III to Battery B. The main attack was directed against the section of the Chinese wall between Caponiers Nos. 2 and 3. Elsewhere the attack was in the nature of a demonstration to conceal the real point of attack. Having assembled considerable forces in Fortifications Nos. 1 and 2, the Japanese rushed the Chinese wall. They were seen in time and a hot fire was opened upon them. The rapid-fire field artillery and Fort No. III opened a deadly fire against them, but the dis-

^a James, pp. 97-99.

tance was so short that the Japanese were able to reach the wall. A bayonet fight took place here. Owing to their great numerical superiority, the Japanese succeeded in breaking through the line. They appeared on the slopes of Redoubts Battery and Eagle Nest, and broke through the wall near the angle where part of it branches off toward Fortification No. 1. Being much damaged by bombardment, this place was favorable for assault. It was impossible for them to break through elsewhere. Two companies of the reserve, coming up at that moment, repulsed the Japanese. One company advanced from Wolf Battery, the other from Redoubts Battery and Eagle Nest. Advancing from three directions, they destroyed all who had entered the breach. At 11.30 p. m. the assault was over. Desiring to get possession of the wall and Eagle Nest at any price, and fully alive to the immense importance of this operation, the Japanese repeated the attack at 2 a. m. The garrison had now been reenforced, and the Japanese could not break through. After an hour the assault was finally repulsed. From this we see (1) that isolated works, situated in the middle of intervals without connection with the forts, fall at the first blow; (2) that without a defensive parapet between the intermediate batteries and the works these batteries would have been just as easily taken; and (3) that three attacks against the wall were repulsed by small forces.

From the foregoing we believe we may safely affirm that only the existence of the Chinese wall saved the fortress from falling in August. It may be said that an entrance was made. True, but at this point the wall was low ($4\frac{1}{2}$ to 5 feet), and it had been breached by projectiles. Where it was sufficiently high and in good condition no breaches were made. This shows, nevertheless, that a parapet without a ditch does not entirely secure an interval against assault. Hence it is not sufficient to supply the intervals with parapets, which are so easily surmounted. Although a parapet without a ditch gives good results, the only safe way to secure the intervals against assault is by constructing a parapet with a ditch, the ditch being the most important feature, as it is crossed with difficulty.

I must, however, remark that the Chinese wall played an important rôle only by accident. In the beginning of the

siege it was not considered of any importance whatsoever. The entire defense of the intervals was to be made on the line of forts. Earth was taken from the wall to fill sandbags for the nearest batteries. It grew thinner day by day and would soon have disappeared in places. It had no bomb-proofs, no embrasures, no garrison. One company was stationed in the vicinity of Fort No. III, and two shelters had been constructed for it.

On August 17, while riding along the line with General Kondratchenko, I invited his attention to the importance of this position. He thereupon ordered General Gorbatovski to send two more companies to the interval between Forts Nos. II and III. The section engineer was ordered to construct shelters for them. The bombardment of the 19th to the 22d of August interfered with this construction, and when the attack on the wall began it was, indeed, in a very precarious condition. Nevertheless, its high profile (8 to 12 feet), the excellent adaptation of the terrain to defense, the lack of dead areas immediately in front, the abrupt inner side of the breastworks which afforded excellent shelter for the infantry, and the good communication with the forts, enabled the wall to fulfill its purpose. It prevented the enemy from breaking through on a wide front, taking the batteries, attacking the forts from the rear, and storming the city. Had there been no Chinese wall, the Japanese divisions would have broken through along the entire front, $1\frac{1}{3}$ miles in width. It would not only have been impossible to stop them with two companies, but even two regiments would not have been sufficient. The following may be alleged in support of the assertion that the fortress would have fallen on the night of the 23d of August had the enemy succeeded in breaking through the wall:

1. Information that the Japanese had broken through the Chinese wall and of their appearance on Redoubts Battery spread rapidly along the entire northeast front and created a panic. The commandant of Fort No. III prepared for the defense of the gorge and burnt the gorge bridge.

2. There was virtually no second line of defense as yet, its entire garrison consisting of only one company of marines.

3. From the main reserve, which consisted of two battalions of the Thirteenth Regiment and two battalions of the Fourteenth, only the two battalions of the Fourteenth could have

been sent into action, as the Thirteenth was stationed in the New European City at a distance of $3\frac{1}{4}$ miles.

4. There was no garrison whatever in the central enceinte. There were only three sentinels near the gates, and two mountain and two obsolete field guns in the redoubts.

There is therefore no doubt that, if the Japanese had been successful in their efforts to break through the wall, they could have entered the city that night. There would have been little resistance at the enceinte and the operation would have been without risk. But such a course would not have been necessary or desirable. The Japanese would have made a series of attacks from the rear upon the intermediate batteries, thrown back the garrisons of the remaining sections of the wall, cut off Forts Nos. I and II from communication with the fortress, taken possession of seacoast batteries Nos. 19, 20, and 22 without opposition, and occupied Dragon Ridge. By morning they would have held in their hands the entire northeast and east fronts of the New Chinese City.

If we consider the natural weakness of the enceinte at Port Arthur and its defenseless condition, we see clearly the difficult position in which the fortress would have been placed. It would have changed hands without further slaughter. But if there had been a sufficient garrison and an adequate armament properly placed, it would have surely fulfilled its function as a second line of defense, and the fall of the fortress would have been postponed for several months.

The rôle of the enceinte is very important, indeed, as a citadel, as a last place for resistance, but not as a mere means of protecting the stores and headquarters of the fortress from sudden attack.

Having determined the rôle of the enceinte, it is necessary to decide which is more important, the fighting line or its enceinte. Preference should certainly be given to the fighting line, for it is here that the fate of the fortress is decided. If this be true, it is evident that the first line must be stronger in every respect than the second.^a The first line

^aLet us recall the words of Colonel Velichko: "On this line of forts the battles for the defense of the fortress must be fought; here the artillery and infantry must offer a decisive resistance to the enemy."

must be permanent, while the second may be temporary—not the reverse, according to the rule followed to-day.

In conclusion we maintain:

1. The necessity of applying the principle of the closed work to the fighting position.

2. That it is necessary that the intervals between the forts be supplied with permanent works.

3. That the enceinte of the city, the function of which is to serve as the last line of defense, should be so constructed as to cover the first line with its fire. In time of peace it may consist only of points of support. During mobilization its intervals must be supplied with intrenchments and obstacles. The points of support being less important than the forts of the first line may be smaller. They may have thinner concrete walls, a smaller number of shelters, no rear caponiers, no galleries for the infantry.

After the fall of the main line of forts the enemy will begin to attack the city. It is probable, however, that the attack of the first line, on account of its duration and stubbornness, will have exhausted the forces and means of the assailants, so that he will not undertake a slow methodical attack upon the city. It is probable, too, that, as the end approaches, the operations will become more intense and that the assailants will attempt to take the last position by open assault. It would be preceded by a bombardment which would necessitate bombproofs for the garrison.

It is desirable, therefore, to have at least one concrete casemate in each interval between the points of support of the second line. Such a casemate should be large enough to accommodate two companies during the war. These should be supplemented by solid bombproof shelters constructed by the reserves and by the inhabitants of the city who labor much more willingly on the enceinte than on the advanced works.

BOMBPROOF SHELTERS FOR THE GARRISONS OF THE INTERVALS.

If we accept the conclusion ^a as to the necessity of erecting during peace, in the intervals between the forts, permanent works and connecting parapets, we close the door which other-

^a See rules on locating forts and redoubts, pp. 78, 79; also remarks pp. 84-88.—Tr.

wise would remain wide open and invite the enemy to enter. We can now be sure that the cross fire of two forts and one redoubt erected in accordance with this principle, reenforced by strong frontal fire from the parapets, would render an attempt to break through between two forts a most hopeless enterprise. The enemy would undoubtedly appreciate the difficulty of such an operation and would either desist from the attempt and begin siege operations, or would endeavor to open a way for himself by a heavy bombardment. The aim of such a bombardment would be the destruction of the parapet at several points, as well as the obstructions, the caponiers covering the ditches, the shelters, and the traverses. In short, he would try to make it impossible for infantry to remain in the trenches.

We saw examples of such pitiless bombardments at Port Arthur during the second half of October and in November and December. As we have already remarked, our defensive parapet, the Chinese wall, did not answer at the beginning of the siege the requirements of such works. Only when its true rôle had been clearly defined—that is, after August 23—was a great number of troops concentrated here, the Thirteenth and Fourteenth Regiments and one battalion each from the Fifteenth and Sixteenth Regiments. The troops occupied sections assigned to them, but there were no shelters. Not until the troops arrived was the erection of shelters begun. As a great number of shelters were needed, it was necessary to resort to the simplest form. Excavations were made under the firing banquette of the parapet and covered with boards or sheet iron and a thin layer of earth. Loopholes were constructed along the firing line and traverses of sand bags were erected on the banquette. Two weeks were necessary for this work. Not until the middle of September was work begun on better shelters for the infantry. For this purpose deep ditches were dug in rear of the banquette and bombproof shelters were built of thick beams covered with a layer of $3\frac{1}{2}$ to 5 feet of earth. Some of these shelters were covered in addition with $1\frac{1}{2}$ to $2\frac{1}{2}$ feet of stones and with sheet iron five-eighths of an inch thick.

Such shelters stood the fall of 6-inch shells, but were destroyed by 11-inch projectiles. These shelters were completed by the middle of November. We could never have finished

them had not the Japanese allowed us to work without firing at us. After the shelters were finished the enemy began to fire daily against the Chinese wall and the shelters in rear. These bombardments wrought great damage. It was necessary to make repairs every night requiring an enormous expenditure of labor and material. Few vehicles were available and there were few men free from service. Nevertheless the shelters were repaired and breaches in the wall itself were filled with sand bags. But in November, when the garrison had been decreased by more than two-thirds, and the daily bombardments were followed by nightly cannonades, further repairs became almost impossible and the defense here was in a most precarious condition. Our daily losses increased considerably and most of the shelters were destroyed. The enemy, having brought his guns and mining apparatus to close range, bombarded the wall day and night. By the middle of December the exhaustion and the strain of the garrison had reached the extreme limit.

It now became apparent to all that parapets without bombproof shelters for the garrison were utterly insufficient. Concrete bombproof casemates should, therefore, be built at the same time that the parapets are built.^a In the immediate vicinity of the fighting line there should be casemates for the men on duty and their officers, and, somewhat farther in rear, for the reliefs off duty. The first should be under the traverses; the second, about 50 paces in rear, under cover of folds in the ground. How many casemates are necessary? For an interval of $1\frac{1}{2}$ miles at Port Arthur, one regiment of three battalions was detailed. During the assaults reserves were brought up. One-third of the force was detailed daily for duty—that is, one battalion of four companies. The men of the battalion on duty remained in the shelters during the day, with sentinels on the parapets. During the night they were reenforced by one battalion. This battalion remained in the shelters, the men being dressed, while the first battalion was on the parapets. The third battalion passed the night in its shelters in rear, with permission to undress.

^a This was proposed by Colonel Velichko, of the Engineers, in his book, *Study of the Latest Methods of Siege and Defense of Land Fortresses*, 1890.

Thus we see that casemates for four companies on a war footing are necessary for the troops on duty. Remembering that the space allotted to one company in time of peace will suffice for two companies during a siege, four casemates, each for the accommodation of a half company during peace, should be erected under the parapet in each interval of $1\frac{1}{3}$ miles at distances of 1,050 to 1,400 feet from each other. One of the other two battalions will always be on duty. Additional casemates should, therefore, be constructed in rear for the accommodation of four companies during a siege. For this purpose two casemates, each for the accommodation of one company in time of peace or two companies during a siege, should be constructed. Therefore, for each interval four casemates for one-half company each and two casemates for one company each during peace should be constructed. On level terrain easily observed by the enemy casemates will be required for sectional reserves, but on broken terrain such casemates will not be necessary.

At Port Arthur the reserves did not suffer in ordinary shelters. It is also difficult to foresee in advance where the reserves should be placed. During a siege this question is easily solved and the reserves may be placed at points little exposed to fire.

The foregoing remarks have been made with reference to the front which is most likely to be assailed by the enemy. In every fortress there are intervals the attack of which, in view of local conditions, is absolutely impossible. In such intervals it will not be necessary to construct casemates. In intervals where attack is possible but less probable a smaller number will suffice.

The timely construction of intrenchments and casemates is especially necessary for fortresses where their construction in time of mobilization is quite impossible or difficult, as, for example, on marshy or rocky ground. There are fortresses on sites where surface water in abundance is struck at a depth of 1 foot. Trenches and shelters can not be constructed here during mobilization. There are likewise fortresses so near the frontier that the period of mobilization will be very short, perhaps only a few days, during which the defense will not be able to do anything on the main line. In such cases the permanent fortification of

the intervals and the construction of concrete casemates are extremely necessary.

MASKING OF THE DEFENSES.

Success in the attack of a fortress depends in a great measure upon ability to observe hits and the effect of fire, the movements of the garrison, transportation, changes of position of guns, the construction of works; in short, success in attack depends upon ability to observe the life of the fortress. The defense naturally seeks to conceal everything from the enemy. Port Arthur had, from this point of view, many negative as well as positive features; unfortunately the positive were due solely to the natural conditions of the locality, while the negative were not corrected in any way by art. The forts, intermediate redoubts, trenches, most of the batteries, and the wire entanglements were clearly visible from afar, even to the naked eye. This was due mainly to the fact that no measures had been taken to mask them. Even from the summit of Fenghuangshan, $3\frac{1}{2}$ miles away, the forts could be observed as if they lay on the palm of one's hand. All the fortifications were erected on the summits of hills, on the green slopes of which the bright yellow clay of the parapets and breastworks were very conspicuous. As the area of each fort was quite large, these yellow spots presented excellent targets, and there was no difficulty whatever in getting the range. The good features of the fortress were due to the fact that immediately in rear of the forts was the high Dragon Ridge concealing from the enemy the entire interval between the line of forts and the city and masking all our movements. Alive to the importance of observation, the Japanese spared no efforts to get possession of points in the vicinity of the forts commanding Dragon Ridge. Hence their energetic attacks on Takushan, which I have already mentioned. After their success at this point they were able to observe part of the harbor and the area between the line of forts and the city. The war vessels had to change their stations immediately, the part of the harbor under observation being forbidden ground. Fortunately, some parts of the harbor could not be observed from Takushan, and the reserve could remain unobserved in ordinary shelters. As it was impossible to observe the left flank of the northeast front

from Takushan, the Japanese erected a second observation station on Pachlunshan. From here the road to the New Chinese City was clearly visible. Whenever a man was seen on this road, the observer informed the nearest battery of 47 mm. guns, indicated the square by telephone, and a salvo from two, three, or four guns was directed against that one man. The Russians were soon compelled to abandon this road and to establish zigzag ways of communication. Ammunition, water, food, and other material were transported only during the night. We have already related the fate of our squadron when 203-Meter Hill fell. Henceforth traffic in the New City became very difficult.

All this shows the importance to both sides of observation of the fortress, the possibility of aid to the attack and injury to the defense. The efforts of the assailants to get a view of the interior are as great as those of the defense to effect concealment. Unfortunately during a siege the defense is limited in its efforts to the construction of covered ways of communication. To provide safe communications along the entire front of a fortress would require so much labor that the task could never be performed by the garrison. Hence means of concealment must be provided in time of peace. The only way to do this, we think, is to plant trees in such a way as to mask the fighting line and the interior of the fortress.

On broken terrain it will be sufficient to mask the fighting position only; on level terrain it will be necessary to mask part of the ground in rear in addition to the fighting line. One belt of trees should run in front of the parapet, and others in rear, the number and width of the belts being determined by the view obtainable from the nearest commanding heights. The first belt should run continuously along the entire perimeter of the fortress. In some fortresses efforts to secure concealment have been made most unwisely by planting trees on the glacis of the forts, the intervals being left without a single tree. Is this not a good means to indicate to the enemy the exact positions of the forts? An uninterrupted belt of trees, on the contrary, will conceal the forts entirely and give no indication whatsoever of their position. Only a part of the area in rear of the works will be masked by this belt. Hence other belts will

be necessary. In some cases belts parallel to the outer line may be necessary; in other cases it may be sufficient to plant trees at particular places only. The trees should not interfere in any case with the fire of the second line against the first.

Shrubs should never be used along the outer line, as they will interfere with the fire of the defense and afford concealment to hostile parties creeping up to our lines before an attack.

It is desirable to use trees having trunks from 3 to 5 inches in diameter planted in regular rows, the lower branches being cut off. Thus a good screen will be obtained and the firing capacity of the works will remain unimpaired. In very broken terrain there will scarcely be any necessity to plant trees. The works may be masked by covering them with turf, or in case there should be no turf near the works, by painting them the prevailing color of the locality.^a The composition used for this purpose at Port Arthur gave excellent results.

^a The advantages of this means are the rapidity with which the work may be done, the small number of workmen required, cheapness, and adaptability to all kinds of terrain. Paint is not washed off by the rain, it can not be carried off by the wind, and it is easy to obtain the shade of the locality.

CHAPTER VI.

(See Plates I, II, III, IV, V, VI, and VIII.)

PERMANENT AND TEMPORARY EMPLACEMENTS—MAGAZINES—
FORTRESS COMMUNICATIONS—SEARCH-LIGHTS—THE TELEPHONE
AND THE TELEGRAPH.

PERMANENT AND TEMPORARY EMPLACEMENTS.

Up to the present time fortress guns have been fired at high angles, the guns being concealed behind parapets. The parapets, however, being situated on the tops of hills or on their front slopes were plainly visible. Moreover, the positions of the batteries were further disclosed by the muzzles of the guns when elevated for firing. Hence, the position of each battery was very quickly and easily determined by the enemy, who then had no difficulty in finding the range. Most of our permanent and temporary batteries at Port Arthur were constructed in this manner.

The permanent concrete emplacements at Port Arthur were as follows: Battery A, for six 6-inch guns; Battery B, for four 6-inch guns on Durlacher seacoast carriages; Tooth Battery, for four 6-inch guns; Sapper Battery, for four 6-inch guns; Battery E, for six 6-inch guns.

All these were erected on summits of hills and were clearly visible at a distance of $3\frac{1}{2}$ miles.

The following temporary emplacements constructed during mobilization were open to the same criticism: Letters Battery, for two 15-cm. Krupp guns; Small Eagle Nest, for three 4.2-inch guns; Eagle Nest, for two 6-inch Canet guns; Redoubts Battery, for three 6-inch guns on high carriages. There were other batteries on summits of hills (Redoubts Battery was on the slope), which were not so noticeable because they were sunk in the ground. The Japanese siege guns were all placed according to modern artillery ideas on the rear slopes of hills for the purpose of using indirect fire. Thus, while our batteries were clearly visible to the enemy, who could follow the operations not only of each

battery, but of each particular gun, we remained utterly ignorant as to the location of his batteries and the number of his guns. This difference rendered the situation of the belligerents very unequal. While the Japanese fired with little chance for error against well-defined targets, we knew not where to answer. As a result, there was either a damaged gun or carriage in each of the above-mentioned batteries at the end of the first day's bombardment.^a At night it was possible to determine the position of the howitzer batteries by the flashes and to injure them somewhat on the following days. It took fifteen days to locate the other batteries.^b We then began to fire at definite not supposititious targets and the conditions confronting the belligerents became a little less unequal. We had lost many guns.^c The lesson was severe and was not forgotten.

When the direction of the attack became evident and it was necessary to strengthen the artillery on the assailed front, ten 75-mm. and two 120-mm. guns taken from the war vessels, as well as several 47-mm. and two 6-inch reserve guns, were placed on Seacoast Ridge and on Spur Hill well concealed from the enemy. The naval guns were placed on the rear slope of the ridge and the 6-inch guns on the front slope of Spur Hill. As they were invisible to the enemy, he never did them the slightest injury, no matter how fierce his fire, as he could not observe its effect. These batteries remained uninjured until the end of the siege.

At the present time the correct position for batteries is not only clear, but there is scarcely a person who would now select any other than a completely concealed position for firing against invisible targets. Such being the case, why should we build permanent concrete emplacements?

Our temporary earth emplacements and their shelters were sufficient to withstand 6-inch projectiles, but they suffered much more than the concrete emplacements. Shelters against 8-inch projectiles may also be lightly constructed.

^a These ideas were modern for the Russian artillery, although they had been put in practice by other nations for ten years. Indeed, they were followed in some of the Russian fortresses, as, for example, at Novogeorgievsk. See telephone message No. 2, p. 65.

^b The Siege of Port Arthur, David H. James.

^c Fort No. III, 2 guns; Redoubts Battery, 1; Eagle Nest, 2; Small Eagle Nest, 1; Battery B, 1; Letters Battery, one magazine blown up.

Both types suffered equally from 11-inch mortar projectiles, but the repair of the concrete emplacements was much more difficult than that of the temporary emplacements. Certainly, by using sufficient concrete, we may secure immunity against destruction and penetration, a thing we can not attain for a temporary earth emplacement, but the thickening of concrete walls will demand a great deal of excavation and will complicate the construction of the emplacements and increase the expense.

Would it not be better to cease constructing concrete emplacements and to build only earth emplacements? The number of these may be greatly increased. Let part of them be unarmed. This will enable us, after the enemy has found the range of a battery, to mount its guns in another emplacement.

Before finally deciding upon this question, another question closely connected with it must be considered. Artillery and engineer officers, who have not seen war, insist upon having a few batteries placed in the open for reconnoitering purposes and to oppose hostile sapping. It would appear that belief in the necessity of such batteries exists only because these persons do not realize that it is possible to bring a rapid and effective fire to bear from a concealed battery against a moving target. We think such belief is founded wholly in error, and that to install guns in the open, even in concrete emplacements, is equivalent to committing them to absolute destruction in a very short time. It will then be necessary to resort to indirect fire from concealed batteries. At Port Arthur the rôle of reconnoitering fell at first upon the following long-range batteries: Letters Battery, with two 15-cm. Krupp guns; Eagle Nest, with two 6-inch Canet guns, and Redoubt No. 3, with two 6-inch Canet guns placed openly on the hilltops.

All the guns of these batteries were damaged in August and September, and then the rôle of reconnoitering batteries devolved upon the 12-inch guns of the battle ships firing from the harbor, the 12-cm. guns on Seacoast Ridge using indirect fire, and one 6-inch gun placed near Mound Battery. The ships fired at a distance of 7 or 8 miles, while the batteries fired at distances varying from $4\frac{2}{3}$ to $5\frac{1}{3}$ miles,

the points of observation being at Eagle Nest and on Great Hill.

It must be said that the firing of the 6-inch, 12-cm., and 75-mm. guns, corrected from Eagle Nest, was very effective. Even in the last stages of the siege no need was felt for battery reconnoitering guns. Sapping at long range may also be successfully opposed by means of indirect fire. At short ranges, mortars in concealed positions should mainly be relied upon. As to batteries which are to oppose assaults, it is true that it is desirable for greater rapidity of fire that the pointer see the target. Such batteries must, therefore, be concealed immediately in rear of the crest and must not be exposed to view until the moment for the assault arrives. We shall speak about them more in detail later.

We have thus come to the conclusion that all of the batteries in a fortress must be concealed from the view of the enemy. Not a single battery should be exposed to view. We must not forget that the best guaranty of success for the offense lies in ability to see, and for the defense, in concealment. If it be possible to conceal our guns in rear of a hill, we must do so. If all our batteries are to be concealed, are not concrete emplacements unnecessary? If, as is true, temporary emplacements for concealed batteries passed through such a prolonged and obstinate siege as that of Port Arthur without essential injury, would it not be well to discard the use of concrete around such emplacements except for the construction of small casemates for the gunners?

Such a change we think desirable. Injuries to earthen parapets or traverses may easily be repaired, but an 11-inch projectile penetrating a casemate will place hors de combat the greater part of the men if not all of them.^a Good concrete casemates will preserve the men during the severest bombardment. In such casemates they will be much safer than in the casemated traverses of the concrete emplacements. A small part of such casemates may be divided off for the officers, kitchens, storerooms, latrines, etc. While

^a The following are instances of losses caused by single projectiles: (1) The detachment commander and 4 men; (2) 5 men; and (3) the detachment commander and 18 men.

we think that concrete traverses should be discarded, we deem it of the utmost importance to provide a number of emplacements with concrete casemates. In order to conceal such casemates effectively from fire, it was found necessary to construct them under the parapets, with exits to the guns. Traverses should be constructed between the guns during the period of mobilization. How many such batteries will be necessary in an interval?

The solution of this question depends upon the number of siege guns which the enemy may bring against the fortress and the time required for him to bring his artillery to bear. The number of the enemy's siege guns multiplied by $1\frac{1}{2}$ will give approximately the number of guns required for the fortress, while the enemy's delay in opening fire measures the interval at our disposal for the construction of temporary emplacements, and, consequently, the number of temporary emplacements that may be constructed. Emplacements which can not be constructed during mobilization must be constructed in time of peace. The relative number of concrete and earthen emplacements must be determined by the nature of the terrain. The more level and open the terrain, the greater will be the number of concrete emplacements required. This question will not admit of a general solution, but must be solved for each fortress separately and for each of its intervals.

Where shall the batteries be placed and what measures shall be taken to safeguard them against assault? The siege of Port Arthur has thrown much light upon these questions. Taking into consideration the plan of the fortress in general and of the intervals between Forts Nos. I, II, and III in particular, we see that these batteries were often on the line of forts (concrete batteries included), a few somewhat in front of the line, and others considerably in rear. The emplacements for these batteries were mostly constructed during mobilization and during the siege. The following batteries were on the line of forts: The batteries in Fortifications Nos. 1 and 2, Caponier No. 2, and Kuropatkin Lunette, Battery B, Battery A, and the batteries in Fort No. I and Fort No. III.

Of these seven batteries, four were mounted in permanent emplacements and three in temporary emplacements. Dur-

ing the first great assault Fortifications Nos. 1 and 2 were taken, with their guns; Caponier No. 2 was taken in October; while Kuropatkin Lunette and Battery B were several times taken by open assault and retaken. These batteries, as well as those in Fortifications Nos. 1 and 2, had no other protection against assault than breastworks and wire entanglements, with the exception of Battery B, which had two rows of trenches in front of it.

These examples clearly indicate a faulty disposition. The batteries should be farther to the rear, so that the enemy may not be able to attack them before he has taken possession of the entire interval. The batteries intended to oppose the enemy's artillery—that is, the intermediate batteries—are the mainstay of the fortress, and should be protected by all possible means against capture. The liability of these batteries to capture is shown by the examples here given. This liability was early recognized by Russian and foreign engineers, and many projects were proposed to protect them.^a Outer ditches were suggested with flanking defenses and artificial obstacles, as well as gorge barracks, machine guns, and infantry garrisons. In this way a battery was to be transformed into a fort. Strange as it may appear, the term battery was still retained to describe such a work.

When an infantry garrison is detailed for the protection of such a battery it is taken from the reserve, and thus the reserve is weakened. Is this wise, in view of the inactivity of the garrison of such a battery, unless the particular battery be assaulted? If these projects be adopted, we shall see forts, redoubts, and batteries—that is to say, a lot of separate works—along the entire interval, each protected from assault, but in a most unpractical manner; for the security from capture of independent fortifications does not preclude the enemy from breaking through between them in many places.

All these measures are directed only against small detachments, on the supposition that the small garrison of the battery will be able to hold out until the arrival of the reserve. Admitting the possibility of small detachments breaking through, we take no measures against them by

^a Such were the projects of Colonel Velichko, Colonel Buynitski, Captain Ilyasheff, the French Captain Sandier, etc.

husbanding an ample reserve, but seek only to render the assault of each particular position difficult. We forget entirely that a sensible enemy will never detail a company to break through an interval, nor a battalion, nor even a regiment, but a division at least. Is not this equivalent to letting the thief enter the house and hiding from him afterwards by locking the cupboard? Is it not better to bar the doors and windows? Would it not be better to avoid useless expenditures for the transformation of batteries into forts and devote the funds allotted for this purpose to the construction of a permanent parapet? Not one of the batteries in rear of such a parapet would need any other measure of protection. The batteries would be safe and would remain batteries, and it would not be necessary to transform them into forts and detail special garrisons for them.

The following batteries in temporary emplacements in rear of the Chinese wall held out to the end of the siege protected only by the wall: Mound Battery, Redoubts Battery, Ravine Battery, Wolf Battery, the Mortar Battery, Eagle Nest, Small Eagle Nest, Letters Battery, Spur Hill, the batteries on Seacoast Ridge and Dragon Ridge, and others. It is true that during the night of August 23 the Japanese almost succeeded in reaching the parapets of Redoubts Battery: but this happened only because the Chinese wall was especially weak at the point breached, was of low profile at this point, and had no ditch, all of which speaks in favor of permanent parapets.

How many guns should there be in each battery? Many artillerymen who took part in the defense insist that all batteries should consist of four guns. They believe such a grouping of the guns is better than any other for securing unity of command and concentration of fire. They say that these ends will be defeated by decreasing the number of guns per battery and increasing the number of batteries. I believe that this opinion arises from the fact that auxiliary apparatus such as telephones, heliographs, etc., were not used extensively by the defense. If a fortress be well supplied with such auxiliaries, these objections will fall to the ground. Personally, I believe in two-gun batteries. By decreasing the number of guns per battery by one-half, the area of the battery is decreased in like proportion, and conse-

quently the probability of hits is decreased. On the other hand, the number of batteries is doubled.^a

As to unity of command, I do not believe that it will be impaired in the least. It is only necessary to have a large network of telephones. In firing against an invisible target the battery commander will not be at his battery, but at the observation station. Will it make much difference to him whether his orders be transmitted to one battery or to two? The Japanese scattered their guns by fours, twos, and even by ones, but succeeded wonderfully well in concentrating their fire against a common target. They attained unity of command by a vast network of telephones. It is therefore desirable, in my opinion, to have two-gun batteries, but in order to be able to fire salvos of four guns a few four-gun batteries may be retained. I believe that such batteries should be supplied with concrete casemates. Temporary batteries constructed between them should have two guns.

The number of batteries would thus be greatly increased, but there will always be ample room for them. They must not be arranged in a narrow line parallel to the line of forts, as in the project of the Austrian engineer, Captain Malchevski von Tarnava,^b but should be scattered over the entire area between the fighting line and the enceinte. It is desirable to arrange them as follows: (1) Mortar and reconnoitering batteries near the line of forts, (2) howitzer batteries, and (3) other batteries. It is also desirable to combine the batteries into groups of four or five under a commander provided with an observation station. Batteries to repulse assaults should be placed along the parapet. In hilly localities they should be immediately in rear of the parapet on heights affording facilities for firing over the parapet at visible targets. The guns should be kept concealed and should be run out for firing only at the moment of the assault.

^a In his pamphlet entitled "Diary of an Engineer," the author says: "I favor increasing the number of batteries in the intervals and decreasing the number of guns per battery. It would then benefit the enemy very little to concentrate the fire of two or three of his batteries upon one of ours. This will necessarily result in his scattering his fire, which will, therefore, be weaker and less effective, and the combat will be upon more equal terms."

^b Beiträge zum Studium der Befestigungsfrage.

MAGAZINES.

The stereotyped plan of arranging the powder magazines of a fortress is as follows:

(a) Service (or expense) magazines at the batteries, with a capacity for one day's supply.

(b) A line of supply magazines about 1,200 yards in rear of the first line, with a capacity for three days' supply.

(c) A line of sector magazines in rear of the supply magazines, each magazine having a capacity for four days' supply for the guns of the sector.

(d) The central magazines, which contain the entire reserve supply.

It was thought that one day's supply at the batteries would be sufficient for immediate use. Each line was to be replenished from the line immediately in rear. Before a projectile reached the muzzle of the gun it was loaded in a wagon or other vehicle, transported, and unloaded four times. It was prepared and filled in the laboratory and then taken to the central magazine, whence it passed successively through the sector and supply magazines to the service magazines at the batteries. This required much time and labor and a great deal of transportation.

But this was not the greatest objection. One day's supply in the service magazines is utterly inadequate to the requirements of artillery duels lasting several days.^a While the main part of the enemy's artillery fires upon the batteries of the defense in order to destroy them, a part of his artillery fires upon the communications leading to the batteries in order to prevent the replenishment of supplies. Railway trains are subjected to shell fire, hand carts to shrapnel fire. Such were the methods of the Japanese at Port Arthur.

Notwithstanding conditions of the terrain favorable to communication with the line of batteries, it was impossible to furnish ammunition during bombardments to the batteries even from the supply magazines on account of the great distance of these magazines from the batteries. In such cases the defense has two lines of conduct which it

^aAs, for instance, the bombardment from August 19 to August 22 and the bombardments of 203-Meter Hill from September 19 to September 23 and November 28 to December 5.

may pursue. It may fire slowly so as to make one day's supply last two days or three days, or it may expend all in one day and cease firing. Both courses are very favorable to the attack and unfavorable to the defense.

In order to avoid this the service magazines should contain at least three days' supply of ammunition; and the supply magazines should contain ammunition for five days and should be so near the first line that ammunition may be brought up during intervals in firing.

Thus we would have on these two lines, one at the batteries and the other very close to them, an eight-days' supply of ammunition, an amount equal to the greatest probable emergency.^a

It is evident that the third line, under the circumstances, is useless, for it is immaterial whether the ammunition be brought to the second line from the central magazines or from the sector magazines. To save time, men, and transportation, all of the rest of the ammunition should be kept in the central magazines.

Thus the magazines of a fortress should be arranged as follows:

1. A service magazine at each battery containing a three-days' supply of ammunition for the battery.

2. A line of supply magazines (one for every three, four, or five batteries) 200 to 350 yards in rear of the batteries containing a five-days' supply.

3. In rear of the enceinte, the laboratories and the central magazines containing the entire reserve supply. The service magazines for the second line of defense should contain ammunition for three days, which should be replenished directly from the central magazines.

An additional reason for the adoption of the plan here suggested is to be found in the defenseless condition of the sector magazines. Lying between the fighting line and the enceinte they might easily be captured by the enemy and destroyed if he succeeded in breaking through the outer line, thus increasing his triumph and weakening our strength.

^a Notwithstanding circumstances highly favorable to the Japanese, such as the railway and two surface roads from Dalny and transportation by sea, they were unable to accumulate more than six days' supply of ammunition in November. In August they had only three days' supply. They thus explain their unsuccessful attacks.

FORTRESS COMMUNICATIONS.

The communications in fortresses connecting the forts and batteries of the main line with each other and with the enceinte are intended to facilitate and quicken, during mobilization and afterwards, the movements of troops, the transportation and distribution of ammunition, and the transportation of guns and various materials for the repair of damages in the forts and batteries of the fighting line. No changes are needed in plans for fortress communications proposed in Colonel Velichko's work. Everybody knows that he initiated the use of railways in our fortresses, for, according to his opinion, successful artillery duels and a stubborn defense are impossible in modern fortresses without a network of railways.^a

As a proof of the great necessity for railways, Colonel Velichko states that the amount of artillery freight to be forwarded to the fighting line is about 72,000,000 pounds. This colossal amount, according to Colonel Velichko, can be transported in a short time only by means of a railway with steam traction. In addition to the vast amount of freight to be transported, railways are necessary to avoid the maintenance of an immense number of horses, which otherwise would be necessary.

The experience at Port Arthur, while it confirms the general idea of Colonel Velichko, enables us to supplement his work. In addition to artillery freight it is necessary to carry a great amount of engineering material required during mobilization and during the entire siege. In addition to armament and supplies for the batteries, it is also necessary to put the intervals and forts in a state of defense. Although Count Todleben has said that, "in order that it be possible to make use of the greater part of the infantry for the stubborn defense of the area situated to the front it is necessary that the defense be first of all an artillery defense," it should be remembered that at Sebastopol the construction of the points of support and defensive walls was simultaneous with the erection and armament of the batteries. If we take into consideration that an energetic enemy will first of all attempt to take the fortress by open assault, there can be no doubt upon

^a Fortresses and Fortress Railways.

this point. It will be clear that while preparing for the artillery defense it will be necessary to prepare at the same time for infantry defense. These remarks have special reference to fortresses without permanent parapets in the intervals. Even if permanent parapets be provided it will be necessary to bring a large amount of material for such work on the intervals as can not and should not be done in time of peace, as for instance:

1. The erection of observation stations for the commandant of the fortress, two or three for the chief of artillery, and others for constant observation.

2. The erection on the fighting line of shelters, traverses, embrasures, and overhead cover.

3. The preparation of artificial obstacles, such as wire entanglements, barricades, and mines.

4. The installment of a network of telephones for the conduct of artillery fire.

5. The placing of the forts and redoubts in a defensive condition.

6. The construction of temporary batteries and magazines.

7. The clearing of the terrain in front of the fortress.

Taking into consideration that the mobilization period for frontier fortresses is always very short, it will be seen that this work must be executed in the shortest time possible, perhaps in a few days. In order to do so it will be necessary to transport hastily a vast amount of material, such as timber, beams, boards, poles, concrete, cement, gravel, sand, sand bags, wire, fougasse bombs, mines, etc.

In Port Arthur about 12,000,000 pounds of freight of this class was carried. The length of the line of defense was 12 miles. A modern land fortress has a line of defense of 27 to 40 miles, which increases the amount of engineering freight to 25,000,000 and even to 36,000,000 pounds.

If we assume that the period of mobilization will last ten days, it will then be necessary to transport daily about 3,600,000 pounds of freight. Assuming the carrying capacity of army two-wheeled vehicles to be 900 pounds and that a horse can make two round trips daily to the positions (20 to 24 miles), about 1,000 vehicles and 2,000 horses would be required. This vast amount of transportation will be necessary for the engineer material alone. Experience at Port Arthur shows

that the demand during the siege for the transportation of material is very great.^a For the repair of the main line of defense during five months almost twice as much material was expended as during the five months of mobilization when it was put in a state of defense. During a siege, material must be transported chiefly at night, between 8 p. m. and 1 or 2 a. m.—that is, during five or six hours. Hence, if the period of the siege is four times as long as that of mobilization (or forty days), 2,000 horses and 1,000 carts will be necessary every night. Thus we see what a vast amount of transportation is required by the engineers.

This transportation should be especially provided for the engineers or otherwise it must be taken from the artillery, to the great disadvantage of the artillery defense. As the artillery manifestly will not consent to this, it will be necessary to provide the engineers with their own transportation, allowing a wide margin for horses killed and wounded. It would be most inconvenient to keep so many horses in time of peace and hardly possible to procure them during mobilization. Thus fortresses will generally have an utterly inadequate number of horses for the transportation of artillery and engineer material, as was the case at Port Arthur, where we were often compelled to neglect necessary defensive works, not on account of lack of material, but because it was impossible to transport it to the points where it was needed.

While the success in the artillery duel depends not only upon the number of guns, but also upon the number of projectiles delivered to the guns, the entire defense of the fortress and its duration depend greatly on the repair of damages by the engineers. It is necessary to have transportation for the needed material.

The adoption of the plan for the arrangement of the magazines of a fortress herein proposed insures a supply of ammunition for eight days, which will enable the defense to maintain a prolonged artillery duel. The position of the second line of magazines in close proximity to the batteries permits the replenishment of the service maga-

^a In the defense of Sebastopol, 240,000 gabions, 130,000 fascines, 1,000,000 sand bags—a total weight not less than 21,642 tons—were expended. The weight of beams, boards, brick, and stone has not been computed, but it was undoubtedly very great.

zines by means of wagonettes, handcarts, stretchers, etc. In fact it almost obviates the necessity of using other means of transportation which may be utilized for the transportation of ammunition from the central magazines to the supply magazines. The engineers are in a different position. It will always be necessary to bring engineer material from the central depots, as the establishment of intermediate depots would be unwise on account of the great danger of their being destroyed. Thus the engineer material will have to be transported from 6 to 10 miles every night from the center of the fortress. The quantity of material which has been found necessary during sieges in the past must be greatly increased for sieges in the future, as the attack will bring much more powerful guns to bear than did the Japanese at Port Arthur.

It is reported that one of the nations of western Europe is manufacturing 12-inch howitzers. We do not know the weight of the bursting charge, but it will certainly be far greater than that of the Japanese 11-inch mortars. In proportion as the destructive effect of the projectile is increased, the damage to the works and the necessary repairs will be increased.

The foregoing considerations, as well as the necessity so signally shown at Port Arthur of concentrating rapidly the greatest possible number of guns on an assailed front, for which an energetic commandant will not hesitate to strip an unassailed front, and the urgent need for rapid transportation for reserves from one front to another, leads us to consider the question of communications as one of great importance, indeed as of no less importance than the proper arrangements for the defense of the intervals between the forts and the correct disposition of the artillery emplacements.

Unfortunately this element of defense was sadly neglected at Port Arthur. There were no railways, no metaled roads—only surface roads. Owing to the rocky soil and the excellent construction of these roads they answered well the purpose of metaled roads. But, as I have already remarked, all the roads had one great defect—they were not sufficiently masked. Many sections ran on slopes or crossed high passes clearly visible to the enemy. All such places were constantly observed by the enemy and the use of the

roads grew more and more dangerous as the hostile troops approached our lines. As early as August it was necessary to abandon some of the roads and make detours.

When the Japanese reached the glacis of the forts in October, communication by day, even by means of a single man, was at an end. Covered passages were then made through the passes for men on foot, and ravines were used for communication. Material and supplies could be transported only by night. Understanding the moral importance of cutting off communication with the fighting line, the Japanese took all possible measures to render this communication as difficult and dangerous as possible. During the day they carefully observed all roads and whenever a single man appeared they opened upon him by salvo with field guns and even with 47-mm. guns. During the night they recognized the approach of trains by the noise of the vehicles and, guided by the sound, opened fire.

Hence the first requirement to be considered in the construction of fortress roads and railways is that they be concealed. An unmasked road is a death trap.

In order to mask the communications, attempts at shortening them must be abandoned. In most fortresses, roads and railways radiate from the center in long, straight lines in order to shorten them, but such roads are exposed to enfilade fire. Roads may easily be masked in a hilly country by taking advantage of defiles, turning mountains by the rear, and digging tunnels through passes. On a level terrain the task is more difficult. Nevertheless they must be concealed. As an excellent means we would advocate the planting of trees: but trees should not be planted in narrow lines on either side of a road, as such an arrangement would only render the road conspicuous. They should not be planted regularly, but in separate woods, groups, orchards, scattered in such a manner as to conceal the road entirely from commanding heights, and even from balloons.

There were no railways in Port Arthur, but the need for them was greatly felt during the siege, especially toward the end, when most of the horses had been killed or eaten. But I am convinced that the use of steam traction would have been of doubtful benefit. The enemy fired at our vehicles during the night, locating them by the noise. It

would be still easier for him to locate a train with a puffing engine having sparks flying out of its smokestack. Hence it would be well to use electric or some other power, which would be free from noise and sparks.

It would also be advantageous to have a supply of horse carts and handcarts, which could be used where movements by rail may be impossible. They would be very useful in a fortress situated on a level site.

Our views may be summarized as follows:

1. Narrow-gauge railways are necessary in addition to a vast network of metaled roads.

2. There should be two classes of railways, permanent railways constructed during peace and portable railways to be laid during mobilization. There should be a permanent belt road. It should run in rear of the batteries immediately behind the magazines, where the road and the trains will be well protected. The portable railways should run from the belt line to some of the forts and to all of the magazines and thence to the batteries.

3. Locomotives should be replaced by some form of traction which does not generate noise, smoke, or sparks.

4. Noiseless automobiles should be used on the roads to transport heavy loads.

5. Long, straight sections should be avoided and the roads should be completely masked.

SEARCHLIGHTS.

During the siege of Port Arthur the searchlights played a secondary part. This was due to lack of practice in handling them and to the small number of searchlights available. The siege, however, showed the great importance of searchlights to the defense. We believe that the searchlight will be as indispensable in the siege warfare of the future as the siege gun, the rifle, and the spade.

The rôle of the searchlight in the defense begins with the first day of the siege and ends with the last. During the early period searchlights impede and embarrass the enemy in moving his troops and in constructing works along the line of investment. Searchlights can not now interfere with the construction of emplacements for siege batteries, as they are all placed on rear slopes or behind screens, and therefore

under cover: but intrenchments and other works on heights may be reached by searchlights, and work here may be greatly hampered at night. The general duties to be performed by searchlights may be summarized as follows:

1. By lighting distant areas, to embarrass the movements of larger bodies of hostile troops and disclose the transportation of freight and the movements of trains, as well as work in progress on the line of investment.

2. By lighting the nearest approaches to hamper mining and sapping work and disclose the approach of assaulting detachments.

3. By forming lighted zones to impede the work of hostile searchlights.

It will readily be understood that it would be very unwise to have one standard searchlight for these three purposes. More powerful searchlights are needed for lighting distant areas than for observing near approaches, while special searchlights are necessary to combat hostile searchlights. It is therefore desirable to have searchlights of two or three different diameters. Searchlights for distant lighting and for neutralizing the effect of the hostile searchlights must be on the forts. In addition, there must be searchlights in the caponiers of the forts and near them to light the approaches to the intervals from the flanks.

The guns in intermediate caponiers are effective at night in covering the approaches to the neighboring fort and intervals only when the gunners can see the target clearly. This is possible with a strong light directed against the point which is being assaulted. In order to use a counter-assault battery effectively a searchlight must be at the immediate disposition of the battery commander. Searchlights should therefore form part of the equipment of intermediate caponiers. There should be complete harmony in the operations of the searchlight and the caponier guns. Such light should illuminate the glacis of the neighboring forts and the nearest approaches to these forts and to the intervals. The searchlight will be useless without the fire of its battery and the guns are useless at night without searchlights, while the greatest advantage is obtained from the combined action of the two. The searchlights may be termed the eyes of the caponier.

As they have a more limited field of operation than the searchlights for distant lighting, the caponier searchlights may be of a smaller diameter—say from 24 to 32 inches.

In order to impede the night work of the assailants, each interval of $1\frac{1}{3}$ miles between the forts should have four searchlights,^a each intermediate redoubt having one. As they will be required to light a limited area between the first parallel and the works, not more than $1\frac{1}{3}$ miles wide, they may be still smaller than the other searchlights—that is, between 16 and 24 inches. Thus the plan for the disposition of searchlights on the main line of defense would be as follows:

1. At each fort a strong searchlight for distant lighting, with a diameter between 36 and 45 inches.

2. A similar searchlight at each intermediate redoubt.

3. At each rear intermediate caponier of the forts two searchlights with a diameter from 24 to 32 inches to flank the intervals. If not close to the caponiers, they should be connected with them by telephone.

4. Four projectors with a diameter from 16 to 24 inches in the intervals between the forts to light the nearest approaches to the intervals.

5. In case there is a second line of defense, which must be placed so that the first line can be seen from the second and covered by its fire, searchlights must be provided for the second line to light the first line in case the enemy breaks through it. A few very strong searchlights are needed here, capable of giving good illumination at about 3 miles. As previously stated, searchlights for flanking the intervals may be located in the caponiers, special embrasures being provided for them. Sometimes local conditions are such that the best effect is secured when the light comes from one side and not from the caponier itself, in which case it should be placed on a flank at such a distance as will give the best effect.

It is difficult to lay down rules for the installation of searchlights, as everything depends upon local conditions.

^a We recommend four searchlights for each interval in order that it be possible, in case a searchlight should be damaged at one of the forts or in the intermediate redoubt, to light the approaches from two sides.

Sometimes it will be best to construct a special caponier for the searchlight; sometimes it should be placed on one of the flanks of the fort or above the caponier. One condition is indispensable. When the searchlight is not placed in a concrete casemate, but in a light-armored cupola or in the open, it must be movable, in order that, by changing its position, the enemy may be impeded in finding its range. In such cases the searchlight may be placed on trucks and moved over rails, as was done at Fort No. III. If the searchlight for flanking the intervals is not placed in the caponier itself, it must be connected with the caponier commander by telephone, who can thus direct it to cease lighting or throw its beam from one place to another or seek a new target.

Searchlights placed in the intervals between the forts must be still more portable, for their function is to impede work which takes place in a direction that can not be flanked. It will be necessary to change the position of such lights quite often. To this end they must be light in weight and independent of the point where the current for them is generated. While searchlights may and even must be uncovered, the apparatus which supplies them with current must be in protected positions. For the searchlights at the forts, dynamos may be installed in the forts. For other lights, dynamos may be placed in the nearest concrete casemate, from which cables may branch off to each of the searchlights; but such a method of procedure has an essential defect, for the cable, in order that the searchlight may be moved from place to place, can not be buried. Although this defect may be remedied to a considerable extent by laying a cable along the entire interval, yet it would be desirable to avoid this dependence of the searchlight on the apparatus by inventing a searchlight carrying its own generator.

The great moral influence of searchlights was often felt by us at Port Arthur. As soon as a light reached our lines we were immediately forced to stop work. During the first days the Japanese did not notice our working parties on account of the great distance of their searchlights (about $3\frac{1}{2}$ miles). Their lights, after remaining upon our works for a few moments, would glide off and we would continue our labor. Later on they succeeded in finding our working parties. They would then hold their lights on our men and open fire.

We had to have recourse to a ruse. Stopping work at the point disclosed we began it at another point, and when this, too, was discovered, we resumed work at the former place. Nevertheless, on account of the small number and the great distance of the Japanese searchlights they interfered with us but little.

To our great regret we have little information regarding the inconvenience caused by our searchlights to the Japanese working parties. As to the advantages derived from searchlights by the defenders in repulsing assaults, I would invite attention to the case previously narrated, where I was an eyewitness. I also select the following extracts from Mr. James's *Siege of Port Arthur*:

The vigilance of the garrison and the havoc wrought by the machine guns, aided by the clever handling of the searchlight when the Japanese reached the entanglements, defeated the attempts of the Japanese to gain the ground necessary for developing the assault.^a

Further on he says:

The devilish utility of the searchlights was again demonstrated by the skillful manner in which they were manipulated in locating the masses of Japanese for the general fire of the garrison.^b

A little further still he says:

A faint rattling of rifle fire came from the foot of Wantai (Eagle Nest). No less than seven searchlights were flashing from the fortifications, and three of these converged on the Panlung (Fortifications Nos. 1 and 2). The rifle fire steadily increased, and the quiet searchlights swung down to where the regiments of the ninth and eleventh divisions were waiting to attack. A few minutes later the rays of light commenced working up and down the slopes of the Panlungs, and Russian rifle fire working down the slope of Wantai could be distinctly heard above the general rattle of musketry. The Japanese reserved their fire for a few minutes, and the Russians, continuing their unchecked advance behind the rays of the searchlights, quickly drove the wasted remnants of the 7th Regiment into the East Panlung.^c

Again:

They had scarcely got moving before they were unmasked by star-shells, and under the glare of a couple of searchlights subjected to a terrific fire from the Keekwan south fort (Battery B) and west battery, and this, coupled with the fire of "Q" (Kuropatkin Lunette) soon broke up their attack.^d

^a James, p. 80.

^b *Ibid.*, p. 84.

^c *Ibid.*, p. 92.

^d *Ibid.*, p. 95.

They were pounced on by the glaring searchlight for the decimating fire of hidden machine guns and riflemen.^a

In the course of his book the author frequently returns to this subject, which seems to have made a deep impression upon him. He assigns the place of honor to searchlights as means of defense. Our space will not permit us to give all of his pertinent references to searchlights, but there are two more which we can not forbear to quote.

In his description of the storming of Idol Redoubt he says:

But all that darkness might have given to the assaulters was sneaked away by the light of the searchlights—a cool, quiet light that aided but one side and hampered the other.^b

According to the author the following incident took place at the storming of Rocky Redoubt on August 24:

In the west the first division commenced some pretty artillery practice on the western searchlights, and shells so frequently blanked the face of the lights that we were not surprised to see two lights die out. By this time the moon had set, and the change giving the searchlights greater power, they were now efficiently employed in the east, where firing broke out afresh. Over in the west, between the Sueishi Valley and the hill 174 metre, many star-shells were falling in pretty confusion and lighting up the blackness of early morning. A detachment of the left wing of the first division, taking advantage of the absence of the two powerful searchlights in that part of the field, were advancing in skirmishing order, and making their presence felt by the Russian outposts, when suddenly the extinguished searchlights reflashd, swung over the sky, and right down on the now perplexed and illuminated ranks of the Japanese infantry. The next act was truly tragedy. No sooner had the searchlights converged on them than from I-tzu-shan (Fort No. 4), An-tzu-shan (Redoubt No. 4), and the approximate ridges roared simultaneous salvos of fortress artillery, and from concealed infantry a long volley of rifle fire. The extinguishing of the searchlights had been a Muscovite trap, which the Japanese stumbled into, and now the searchlights kept crossing and recrossing each other's rays in a bewildering manner, and it needed all the strenuous efforts of the artillery to extricate the advanced Japanese. Then all became significantly silent in the west.^c

We have given this testimony of an eyewitness to show the absolute necessity of providing fortresses with searchlights in great numbers, and to counteract the opinion of those who may think that we are too enthusiastic in advocating the general adoption of searchlights.

^a James, p. 97.

^b Ibid., p. 121.

^c Ibid., p. 96.

THE TELEPHONE AND THE TELEGRAPH.

Each of the elements of defense of a modern fortress is so important that it is difficult to say which is most important. In saying that the line of forts, redoubts, and batteries plays a most important rôle, it must be understood that without adequate communication between these works themselves and between the works and the enceinte they will not be able to fulfill the part expected of them. Thus communications are not less important than forts and batteries. But even with most excellent roads, the works will perform their function most imperfectly if unprovided with such appliances as will enable their operations to be combined. The maximum strength of the defense may be developed only by the faultless cooperation of the different works.

Thus it may be necessary to concentrate the fire of the batteries on a certain target, it may be necessary to change target quickly, or to assign batteries to different targets, or to order one fort to support another, or to order the reserves to hurry to a distant point. We shall not undertake to enumerate all the cases where it may be necessary to send orders quickly to distant points.

The value of such apparatus as will insure the prompt transmission of the orders of commanders is recognized willingly by everybody, yet in many fortresses the provision of such apparatus is neglected. Thus at Port Arthur there was none at all in time of peace and the network of telephones had to be laid hurriedly during mobilization. It is easy to understand that a hastily established telephone system will not operate regularly and uninterruptedly as is necessary and desirable. We then saw clearly the necessity of installing an adequate telephone system in time of peace equal to the demands that may be made upon it in war.

The first essential is that there be two practically independent systems. The first system should connect the works with each other and with the commandant. This system should be installed simultaneously with the construction of the fortress. The other system should be for the service of the artillery, its principal object being to enable the chief of artillery to conduct the fire of his batteries. A part of

this system connecting the batteries in temporary emplacements can, of course, be installed only when these batteries are constructed; that is, during mobilization.

The second essential is that these communications should function without interruption during the heaviest bombardments. This can be attained by the establishment of underground connection and by wireless telegraphy.

The necessity for two separate telephone systems and for uninterrupted connection was fully demonstrated at Port Arthur, where a vast telephone network was established. The headquarters of the fortress was connected with a central station, which in turn was connected with section central stations. These section central stations were connected with the headquarters of the detachments; which, in their turn, were connected with the various works. The chief of artillery had no special telephone system at his disposal, but had to use the general fortress system. This system had to serve for the transmission of the orders of the staff of the fortified sector, the instructions of the commandant and other authorities in command, and the numerous reports of the detachment staffs, forts, batteries, observation stations, etc. The large number of telephones in use led to the establishment of many intermediate central stations.

In order to transmit an order to a fort or battery, it was necessary to call up several central stations. The connection demanded was often busy, and much time was lost in waiting. As a consequence, orders frequently arrived when they had become useless. At the appearance of a moving target the observation stations were ordered to report to the chief of artillery for orders, but when the order "such or such battery open fire" was received, the target had often disappeared or had gotten beyond the range of the battery. During battle the control of the fire of the batteries was well-nigh impracticable for the chief of artillery, as reports, orders, and instructions were received in great numbers from all sides just at the time when it was necessary to issue orders and instructions. It was on account of this circumstance that it was rarely possible to concentrate the fire of as large a number of guns as the Japanese. Whenever this was possible it was not on account of the fire control being concentrated in the hands of one chief, but because of the activity of in-

dependent chiefs of sections and battery commanders. The Japanese were able to concentrate their fire in such an excellent way by means of a well-organized system of communication.

We find the following statement in Mr. James's book in regard to this fact:

From the siege park a heavy concentration of direct fire upon the eastern forts was possible. * * * The artillery commander, General Teshima, directed the battery fire from Observation Hill (center Feng-hwang-shans), from which point a systematic network of telephone wires connected up subordinate artillery observation points and the balloon section operating in the rear.^a

Somewhat before these lines we read:

General Nogi was in touch by a perfect system of telephone wires with all branches of troops, while the hospital service was directed similarly by General Ochai. Ammunition columns, commissary depots, pioneer corps, engineers, sappers, and auxiliary arms were in direct communication with headquarters, as also the naval detachment, while wireless communication was maintained from Dalny and Shaio-ping-tao with the blockading squadron under Admiral Togo.^b

The author explains in another part of his book that there were two separate observation stations for the commander of the Japanese army and for the chief of artillery, so that they were able to make observations and to transmit orders independently of each other. We find the same statement in Mr. Ellis Ashmead-Bartlett's book,^c who indicates the points, where these stations were established, in the plan appended to his work.

In the same book we read interesting information concerning the fact that the Japanese storming columns were supplied with telephones which connected them with the divisional staff on the one hand and with the batteries on the other, thus enabling the artillery to support the columns, to cease firing at the opportune moment, to change target, to correct its fire, etc.

Thus the Japanese by a proper use of the telephone could conduct operations harmoniously during assaults, as well as during bombardments. To this fact much of their success

^a James, p. 70.

^b Ibid., p. 69.

^c Port Arthur, the Siege and Capitulation, by Ellis Ashmead-Bartlett. 2d ed. Edinburgh and London, W. Blackwood & Sons, 1906, p. 163.

must be attributed. Their undertaking would have been more difficult had we made a judicious use of the same means.

The defense has the advantage of being able to establish its communications in time of peace. It can use all the newest technical appliances, which the attacking party can not always have at hand. Wireless telegraphy has reached such a state of perfection that its use for communication in a fortress is not only desirable but necessary. But as the use of wireless telegraphy may be hampered by its use in the hostile army, it should not be the chief or only means of communication. Other means, such as the ordinary telegraph and the telephone, are necessary.

We have already said that it is absolutely necessary for the communications in a fortress to function without interruption during bombardment. This end may be attained by using underground connection for the telephone, the cables being buried deep in the soil. All of the defenders of Port Arthur concur in the opinion that overhead wires must be discarded, but opinion is divided as to the best method of laying the underground lines. Some maintain that the cables should be laid so deep that they may be safe from the largest projectiles. To repair defects they recommend that manholes be provided at distances of about 150 to 200 feet. Others maintain that deep trenches are not necessary, that projectiles would rarely hit the cables if buried in shallow trenches, and that it will be sufficient to secure the lines from shell fragments by burying them in trenches at a depth of 1 to 1½ feet.

I have come to the following conclusions as a result of my experience at Port Arthur:

1. All overhead telephone lines in a fortress must be replaced by underground connections.

2. The underground telephone system of a fortress may be divided into two parts—one within the area of constant artillery fire and the other outside of this area.

3. Part of the telephones situated within the area of constant artillery fire must be secured entirely from injury, and the cables must therefore be buried as deeply as possible, while the other part nearer to the enceinte and liable only to chance hits, may be secured only against shell fragments and concussion from shells bursting in the vicinity.

4. Cables buried at a depth of 1 foot often refused to work, notably at Fort No. III. When the cable was examined it was found that it had not been damaged by projectiles. It still refused to work. On further examination it was ascertained that the cable had been injured by water, connection with the earth being thus established. The cable was then placed in a triangular trough made of thin boards, and the line worked perfectly. As this may always happen, it is desirable to place the cables in such troughs.^a

5. To insure uninterrupted service it is necessary to have a double connection between each important point and the headquarters of the detachment commander to whom it is subordinate, in order that one line may be available if the other is damaged.

In general, the plan of fortress telephones, according to our opinion, should be as follows (see Pl. V) :

1. The headquarters of the fortress should be connected with the chiefs of detachments, the observation stations of the chief of artillery and of the commandant, and the individual forts.

2. The central stations of headquarters of detachments should be connected with each other, with the central stations of sections, and the observation stations of the detachments.

3. The central station at section headquarters should be connected with the forts and other works of the section.

4. The central observation station should be connected with fortress headquarters, the commandant's observation stations, and the observation stations of the chiefs of groups who should be connected with the batteries of their groups.

Such a system will enable the commandant to direct the general course of operations, the chief of artillery to control the fire of the batteries, and the chiefs of detachments to direct the operations of the forts and other works and the troops in the intervals.

The forts may communicate directly with fortress headquarters.

Metallic connection and underground cables will secure the uninterrupted working of the lines.

^a This applies to temporary lines. In permanent lines the cables should be laid in conduits of more durable material.

The following lines need not ordinarily be deeply laid:

1. Those connecting fortress headquarters with the commandant's observation stations.
2. Those connecting fortress headquarters and detachment headquarters.
3. Those connecting the observation stations of the chief of artillery with fortress headquarters and the artillery observation stations.

The detachment and section headquarters are comparatively secure, and therefore their cables need not be deeply laid. Certain sections of the artillery network should be securely laid; but as these cables must be laid during mobilization, much will depend upon the time available. The lines connecting the forts with each other and with section headquarters should be laid securely during peace.

A railway telegraph line is likewise necessary, connecting the railway stations and fortress headquarters. The same measures should be used for its security as for telephone lines.

Wireless telegraphy may be used to connect the fortress with other cities situated without the lines of the blockading army, to connect a coast fortress with the fleet, to connect fortress headquarters with the advanced fortified positions, and to connect the fortress with isolated works.

Various means of signaling, such as the heliograph and the semaphore, may be of great service to the defense, but these systems require much peace training for the personnel, which must be well acquainted with the terrain, for otherwise little will be accomplished.

CHAPTER VII.

(See Plate I.)

GARRISON FOR A MODERN FORTRESS—INFANTRY—ENGINEER TROOPS.

In Chapter III we gave the reasons why the line of forts at Port Arthur was so close to the city. An important reason lay in the necessity of making the line of defense correspond with the small garrison.

This garrison was fixed at 11,300 men. The length of the line of forts was only 10 miles. Thus there were 1,130 men per mile of perimeter. This figure is approximately the same as that adopted in Germany (1,100) in the allotment of garrisons to fortresses; but the Germans have additional mobile troops for the active defense of positions. It is evident that after the investment these troops will form part of the garrison, thus increasing it to a considerable extent. It was evident at Port Arthur before the beginning of the siege that it would be necessary to occupy a few advanced positions for the successful defense of the fortress. If the fortress were not to be reenforced, it would be necessary to scatter 11,300 men over 14 miles, giving only 807 men per mile. With such a garrison a successful defense was hopeless. It would have been necessary then to desist from the defense of the advanced positions, but the importance of these positions was so great, as previously stated in Chapter IV, that it was impossible to think of a protracted defense without them.

Colonel Velichko's comments are very apposite upon this question. "It is impossible to decide defense questions wisely," said he, "when your superiors say to you, 'this city is very important and we shall assign a garrison of 25,000 men to defend it. Construct a fortress here to be manned by 25,000 men. That port is less important, and we shall assign only 8,000 men to defend it. Construct a fortress there to fit a garrison of 8,000 men.'"

But luck smiled unexpectedly on Port Arthur. At the last moment the garrison was increased considerably by chance. When the investment began it consisted of 41,016 men, of which 34,503 were combatants fit for duty, 4,189 noncombatants, and 2,324 sick in the hospitals.^a If we add to this the Kuangtung naval brigade of 3,500 men, other small detachments, and 13 companies of citizens—2,500 men, we find that the garrison consisted of about 50,000 men, more than four times the garrison originally intended. Let us see how this garrison was distributed and how it answered the needs of the defense.

At the time of the investment the garrison was distributed as follows:

1. For the defense of the seacoast batteries, $1\frac{1}{2}$ battalions.
2. For the occupation of the advanced positions and the line of forts, $25\frac{1}{4}$ battalions.
3. General reserve, $7\frac{1}{4}$ battalions.
4. For the enceinte, 13 companies of volunteers and 1 rifle company.

One question immediately suggests itself. With such a large garrison why was it not possible to detail a larger reserve? Seven and one-fourth battalions were less than one-sixth of the entire strength.

We find the detailed distribution of the garrison in the orders of the commandant of July 30, 1904. It is as follows:

*Disposition of the garrison of the fortress of Port Arthur (No. 2)
July 17, 1904.*

For the defense of the fortress the troops are assigned as follows: ^b

1. SEACOAST FRONT.	
a. Western section.	
(Lieutenant Colonel Stolnikoff.)	
27th East Siberian Rifles, 1 company.	} To defend Tiger Peninsula from the barracks of the 27th East Siberian Rifle Regiment to Tigers Tail, inclusive.
28th East Siberian Rifles, 1 company.	
Kuangtung Naval Brigade, 1 company.	
Total, $\frac{3}{4}$ battalion.	

^a Official data.

^b The units of the advanced detachment shall occupy the points designated in the disposition, after evacuating the advanced positions on Fenghuangshan.

b. Eastern section.

(Lieutenant Colonel Vepritski.)
Kuangtung Naval Brigade, 4 companies.

Total, 1 battalion.

To defend the section from Golden Hill to Battery No. 22, inclusive.

2. LAND FRONT.

(Major General Kondratchenko.)

a. First section.

(Major General Gorbatovski.)

25th and 26th East Siberian Rifles, 6 battalions.

15th and 16th East Siberian Rifles, 6 battalions.

28th East Siberian Rifles, 1 battalion.

3d and 7th reserve battalions, 2 battalions.

Kuangtung Naval Brigade, 2 companies.

Frontier Guards, 2 companies

Railway Battalion, 1 company.

1st battery, 4th East Siberian Artillery Brigade, 8 guns.

1st battery, 7th East Siberian Artillery Brigade, 8 guns.

57-mm. rapid-fire field battery, 6 guns.

2 independent batteries, 8 guns.

Total, 16½ battalions and 30 guns.

To defend the section from Cross Hill to Fort No. V, inclusive, including all forts, redoubts, batteries, and trenches on this line of defense, and to occupy the advanced posts at Siaokushan, Takushan, the Aqueduct, Idol Redoubt, Miaoshan, and Pachtunshan.

b. Second section.

(Major General Tserpitski.)

5th East Siberian Rifles, 3 battalions.

27th East Siberian Rifles, 2½ battalions.

28th East Siberian Rifles, 1½ battalions.

Kuangtung Naval Brigade, 1 battalion.

Mining Company.

Mixed company of the 11th and 12th East Siberian Rifles, 1 company.

4th East Siberian Artillery Brigade, 16 guns.

Total, 9 battalions and 16 guns.

To defend the section from Fort No. V to White Wolf, including all the forts, redoubts, batteries, and trenches on this line of defense, and to occupy the advanced posts on Division Hill, 203-Meter Hill, 174-Meter Hill, and Liaotesan.

3. GENERAL RESERVE.

(Major General Fock.)

13th and 14th East Siberian
Rifles, 6 battalions.
4th Reserve Battalion.
7th East Siberian Artillery Di-
vision, 16 guns.
4th East Siberian Artillery Bri-
gade, 8 guns.
Kuangtung Sapper Company.
4th Sotnia of the First Verkhneu-
dinsk Cossack Regiment.
Total, $7\frac{1}{2}$ battalions, 24
guns, and 1 sotnia. .

To occupy Old City and New City :
In the Old City : the 14th East
Siberian Rifle Regiment and 2
batteries of the 7th East Sibe-
rian Artillery Division near the
barracks of the 10th Regiment.
In the New City : the 13th East
Siberian Rifle Regiment, the
4th Reserve Battalion, and 1
battery of the 4th East Siberian
Artillery Brigade near the bar-
racks of the 11th Regiment.
The sapper company will be dis-
tributed along the entire line of
defense.

4. CENTRAL ENCEINTE.

(Lieutenant Colonel Duvernois.)

12 companies of volunteers.
Port Arthur Foot Company.
Detachments of the 9th and 10th
East Siberian Rifles, 1 company.
Total, 14 companies.

To defend the Central Enceinte
from Redoubt No. 1 to the
railway station.

5. Reports will be sent to fortress headquarters.

The small reserve was divided into two parts, so that there was one regiment each in the old and new cities, at a distance of 6 miles from each other. The line of forts was likewise weakly occupied. Thus, on General Gorbatovski's section, between Cross Hill (B. No. 19) and Fort No. V, after de-tailing twelve companies to garrison Takushan, Siao-kushan, the Aqueduct position, Idol Redoubt, and Pach-lunshan, and one company each to seventeen forts and re-doubts, only thirty-six companies remained for the defense of 8 miles of interval, which gave four and one-half companies per mile, without local reserves.

When active operations began, the disposition of the troops was immediately changed, as it was found that four and one-half companies per mile of interval were utterly insuffi-cient. The Thirteenth Regiment reenforced the interval between Forts Nos. II and III, and part of the Twenty-eighth Regiment the interval between Forts Nos. I and II. When it became evident that the main attack would be made

against the interval between Forts Nos. II and III, one battalion of the Fourteenth Regiment reenforced the Twenty-eighth.^a

On the fourth day of the bombardment, there remained in the fortress only two battalions of the reserve. About noon it was found that a break might be made in the interval, and 1,500 men were taken from the vessels and formed into a naval brigade. This force was sufficient to hold the line, but it was not strong enough to retake the redoubts. It now became evident that the garrison was hardly adequate to hold the fortress and far too small to keep the advanced positions and even two fortifications in the center of the interval.

At the beginning of the attacks two battalions each of the Thirteenth and Fourteenth regiments and two companies each from the Fifteenth and Sixteenth regiments, in all five battalions, or twenty companies, were concentrated to defend $1\frac{1}{3}$ miles of interval—or about fifteen companies per mile.^b Seven companies formed a local reserve for the entire front of 4 miles. This garrison was sufficient for passive defense, but it was necessary to desist from sorties in masses. The garrison melted like wax from constant losses and by November very few companies had more than 60 or 70 men. Uninterrupted work exhausted the men and bred disease. It was impossible to relieve the men at the front to let them rest, which had fatal consequences, as exhaustion brought about loss of spirit and the thought of surrender.

Toward the end of the siege there remained about 5,000 men in good health in the fortress and only about 12,000 men fit for fighting. The number of men put hors de combat was 26,000, more than twice the normal garrison of 11,300 men.^c One of the main causes of the failure of the defense is to be found in the inadequate garrison during the latter part of the siege and the complete exhaustion of the men.

Hence we come to the conclusion that one of the most important requirements for the successful defense of a for-

^aAt the same time attacks were made against the west front, and it was therefore impossible to weaken the garrison there.

^bThe company at that time counted from 120 to 150 bayonets.

^cTwelve thousand killed and 14,000 sick and wounded in the hospitals.

truss is that the garrison be large enough so that a relief may rest occasionally for a short interval.

How large must the garrison of a modern fortress be under these circumstances? To answer this question as fully as possible we shall divide the entire garrison into its component parts, according to the arms of the service, and we shall be guided by experience gained at Port Arthur.

INFANTRY.

This arm was the most numerous. It consisted of nine regiments of rifles, three reserve battalions, two companies of frontier guards, one mixed company of rifles, the Kuangtung Naval Brigade, and a landing force from the ships. In the beginning of the siege the entire infantry force amounted to 29,000 men. The number gradually decreased to 17,000 on November 15. During November the fortress withstood a series of assaults, and the garrison was still able to struggle on with success. By December 15 it was seen that it was impossible to continue to hold 203-Meter Hill for want of men. Only 13,897 men remained, a minimum number for the defense of the line of forts. We shall take this number as a basis to determine the necessary strength of the garrison.

Taking the official disposition of the troops, we find that 4,755 men were concentrated along the assailed front of $2\frac{1}{3}$ miles, and 7,730 men on the unassailed front of $10\frac{2}{3}$ miles.

The reserve of the attacked front consisted of 406 men; the reserve of the unattacked front of 496 men, and the general reserve of 510 men.

Consequently there were 2,038 men per mile on the attacked front, or 1.16 per yard.

On the unattacked fronts there were 725 men per mile, or 0.41 man per yard.

Duty was performed as follows:

One-third of the men were on duty, one-third were repairing damages, and the remainder were divided into two sections, one of which rested without undressing while the other rested undressed.

Half of the reserve was detailed every night for urgent work. Thus the men at the front slept every third day and the men of the reserve every other day. But as a night sel-

dom passed without an alarm, it was impossible to sleep throughout the entire night. This told both on the physical and mental condition of the troops, and it was clearly seen that for further stubborn defense double the number of men was necessary in order to give the relief a complete rest.

Taking the figures just deduced and assuming the radius of a fortress to be 6 miles, let us now compute the required strength of the garrison. The circumference of the fortress will be $37\frac{2}{3}$ miles, the number of forts 23, and number of intermediate redoubts 23. Let us assume that the attack is directed against 3 forts, 2 redoubts, and 2 intervals, the total extent being $2\frac{2}{3}$ miles.

There would be 1.16 men per yard on the attacked front and 0.41 man on the unattacked fronts. Consequently we will have in our example: 1, on the attacked front, 5,000 men; 2, on the unattacked front, 20,800 men; total, 25,800 men.^a

To afford rest to the men it is necessary to double this number, and we therefore obtain $25,800 \times 2 = 51,600$ men.

We have seen how insignificant were the general and local reserves, which consisted of less than one-tenth of the entire force. In consequence of this in December it was impossible to support the positions energetically when assaults were directed against them, and they had to be evacuated. This demonstrates the necessity of having a reserve of at least one-fourth of the force on the fighting line—that is, one-fourth of 51,600, or 12,900 men.

We thus obtain a total of $51,600 + 12,900 = 64,500$ men. But during the five months of the siege the infantry garrison incurred a loss of more than 50 per cent, as it numbered 29,000 men at the beginning of the siege and only 13,897 in November. Having computed the garrison necessary at the end of the fifth month, without taking account of losses, we must double the figure obtained and we thus arrive at the required strength of the garrison— $64,500 \times 2 = 129,000$ men.

This is not an overestimate. Such great numbers are required on account of the great losses in modern fortress warfare and the necessity for rest, without which a stubborn

^a The author's figures all through this calculation are very rough, his approximations reducing the total from 30,558 to that given, 25,800.—Tr.

resistance is impossible. We are convinced of this by the following plan for the disposition of such a garrison at the beginning of the siege:

Garrison for 23 forts, 400 men each, and 23 redoubts, 200 men each.....	14,000
Garrison for the intervals of the attacked front.....	5,000
Garrison for the intervals of the unattacked front.....	20,800
Local reserves.....	12,900
General reserves.....	76,300
	<hr/>
	129,000

After five months' siege with 50 per cent of losses:

Garrison of forts necessarily the same.....	14,000
Garrison of the intervals of the attacked front.....	5,000
Garrison of the intervals of the unattacked front.....	20,800
Local reserves.....	12,900
General reserve.....	11,800
Losses.....	64,500
	<hr/>
	129,000

The general reserve is such that a relief can be given only every third day. Hence after one or two months this reserve will have melted away and then there will be no rest whatever. We do not increase the number, however, as having had a rest every second day at the beginning of the siege and every third day later on, the garrison would be able to hold out three months even under the conditions at Port Arthur. But it is clear that 129,000 is not an overestimate, but rather an underestimate.

Let us see now how the construction of a parapet between the forts would affect the infantry garrison. For the defense of permanent works fewer troops suffice than for a combat in the open. Hence the construction of a parapet permits a decrease in the garrison. To develop sufficient fire, it would not be necessary to detail more than 0.642 men per yard of the attacked front and 0.214 men per yard of the unattacked fronts. We thus obtain:

$$\left. \begin{aligned} 1,760 \times 0.642 \times 2\frac{2}{3} &= 3,000 \text{ men} \\ 1,760 \times .214 \times 35 &= 13,000 \text{ men} \end{aligned} \right\} \text{Total, 16,000 men.}$$

This number must be doubled to afford rest for the men: hence $16,000 \times 2 = 32,000$ men.

The reserve may be decreased, as the ditches are obstacles against assault. Hence we will take the reserve at one-fifth, or 6,400 men. $32,000 + 6,400 = 38,400$ men. Doubling this number in view of losses, we see that the infantry garrison should number 76,800 men.

If we distribute this garrison on the positions according to the above-mentioned plans, we shall have—

At the beginning of the siege :

Garrison of the forts	14,000
Garrison of the intervals of the attacked front	3,000
Garrison of the intervals of the unattacked fronts	13,000
Local reserves	6,400
General reserve	40,400
	<hr/>
	76,800

After five months' siege :

Garrison of the forts	14,000
Garrison of the intervals of the attacked front	3,000
Garrison of the intervals of the unattacked fronts	13,000
Local reserves	6,400
General reserves	2,000
Losses	38,400
	<hr/>
	76,800

The general reserve of 2,000 men does not allow the men on duty to be relieved. Hence in order to have a rest at least every third day it is necessary to add at least 3,000 or 4,000 men. The infantry garrison should therefore number about 80,000 men. Thus permanent works in the intervals will enable us to decrease the garrison by about 50,000 men.

ENGINEER TROOPS.

The siege of Port Arthur has shown the necessity of the following engineer troops :

1. At each fort and at each intermediate redoubt, one section of sappers with two officers to repair damages, and at attacked forts, in addition to the preceding, one platoon of miners with four officers for mining work.

2. On unattacked fronts, one section per interval to repair damages.

3. On attacked fronts, one section per interval to repair damages.

4. At the reserve of the attacked front :
 - a.* One platoon per interval for emergency work.
 - b.* One company for counter-approach work.
 - c.* Three platoons of miners.

Applying these rules to our fortress, we would require :

1. At the 23 forts, 23 sections.
2. For unattacked intervals, 21 sections.
3. For attacked intervals :

(<i>a</i>) Sections -----	2
(<i>b</i>) Platoons (reserve) -----	2
(<i>c</i>) Companies (reserve) -----	2
Total number of sapper sections -----	46
Platoons -----	2
Companies -----	2
Total of sapper companies -----	8
Miners for 3 forts—platoons -----	3
Miners for 2 intermediate redoubts—platoons -----	2
Reserve—platoons -----	3
Total miners—platoons ^{<i>a</i>} -----	8
or 2 companies.	

Increasing the number of sappers 25 per cent in view of losses and for unforeseen work (second line of defense, roads, etc.), we find that ten companies or two and one-half battalions are required.

There will be about 130 miles of railway for the operation of which not less than one battalion of the railway troops will be necessary. One battalion of telegraph troops and a balloon section for three stations will also be required.

^{*a*} The Russian sapper company consists in war of 4 officers and 251 men. A platoon is understood to be $\frac{1}{4}$ of a company and a section $\frac{1}{2}$ a platoon. With this assumption, the total number of sapper companies in the table should be $8\frac{1}{4}$.—Tr.

CHAPTER VIII.^a

(See Plates V, VI, and VII.)

DETAILS OF THE CONSTRUCTION OF FORTS—LARGE CALIBER GUNS IN FORTS—NECESSITY FOR TURRETS FOR OBSERVATION AND GALLERIES FOR THE INFANTRY—SHELTERED COMMUNICATIONS IN FORTS—SHELTERS FOR COUNTER-ASSAULT GUNS—ARMAMENT OF THE FORT—CASEMATES FOR THE GARRISONS OF FORTS AND COMMUNICATIONS OF FORTS WITH THE REST OF THE FORTRESS—SHELTER FOR THE MEN ON DUTY—TELEPHONES AND SIGNALS—THICKNESS OF CONCRETE WALLS—DITCHES AND OTHER OBSTACLES—COUNTERSCARP GALLERIES—THE INSTALLATION OF SEARCHLIGHTS IN THE FORTS AND THE ILLUMINATION OF THE DITCHES—COVERED PASSAGES—THE GARRISON OF THE FORT—THE PARADE OF THE FORT—THE MASKING OF FORTS.

DETAILS OF THE CONSTRUCTION OF FORTS.

A fort, as a point of support, must fulfill the following requirements:

1. That all attacks upon it be rendered as difficult as possible.
2. That it be able, unaided, to repulse attacks upon it.
3. That it be able to defend the intervals to the right and left of it.

Unless a fort fulfills these three requirements, it can not be considered as a useful factor in the defense.

Forts are now built of such strength that open assault is a hopeless undertaking. Hence we are led to believe that the enemy will not attempt to storm them but will attack the intervals between them. Such was the course pursued by the Japanese at Port Arthur. The intervals must therefore be strengthened, and there are many who advocate permanent fortification for them. If this be adopted, if the fire of rear caponiers be widely utilized, as well as the flanking fire from the forts, the capture of an interval will become a most difficult feat, and it will probably lead the enemy to attack the fort instead of the interval.

^a This chapter is taken from my essay "Notes on fortification from the siege of Port Arthur," written in the fortress and published in No. 9 of the Engineering Journal for 1905. The essay is here revised and amplified.

In former times the attack was first directed against the salient angles; bastions were constructed and the attack was directed against the curtain; ditches were dug in front of the curtain and the attack was directed against the bastions.

Forts are rightly called "points of support," because sorties, advances, and other operations can not be made without their assistance.

The fall of a redoubt in an interval does not involve the fall of an important part of the main fighting position. It is otherwise when a fort is taken. Port Arthur affords excellent examples of the two cases. In August—that is, at the very beginning of the siege—the Japanese took Fortifications Nos. I and II in the interval between Forts Nos. II and III. This was, indeed, a great misfortune to us, but, nevertheless, the remaining part of the position held out four months, with the assistance of the Chinese wall. On December 28 Fort No. III was taken, and on the very night part of the position was evacuated by us. When, three days later, Redoubt No. 3 was taken (a fort, in reality), the entire position had to be abandoned, and we had to go to the second line of defense.

The permanent fortification of the intervals decreases the importance of the forts to a certain extent, for it is quite possible that with a permanent parapet it would not be necessary to evacuate the line after the fall of a fort. But even with permanent parapets, forts will play a very important part in the defense as a protection for the parapet, for until the forts are taken it will be very difficult to reach the parapet.

We therefore believe that permanent parapets in the intervals between forts will change the point of attack from the interval to the fort. Hence it will be necessary with permanent parapets to strengthen the forts further in order that they may be able to meet fully the three requirements of a fort.

In order to render the attack upon a fort as difficult as possible, and to enable it to resist attacks unaided, it should have—

1. Effective obstacles against assault that can be well covered with fire.

2. Outworks to cover the approaches, so constructed that it should be impossible to destroy them by bombardment or by progressive attacks.

3. Bombproof shelters sufficient for the garrison and for the counter-assault guns.

The third condition demands the construction in a fort of shelters for observation not only to the front, but also to the flanks of the fort, and for uninterrupted artillery and infantry support of the neighboring intervals and redoubts, even under the hottest fire. For artillery such shelter is already provided in the shape of rear caponiers, but armored turrets for observation and firing galleries for the infantry must be provided.

I do not understand why we construct sheltered caponiers for the guns and allow the infantry to fire without cover. Is it possible that fragments of projectiles and shrapnel are found to be less dangerous for infantry than for guns? Is the disabling of one gun more important than that of ten infantrymen? Is it the intention to give preference to artillery defense over infantry defense? We certainly think not. It is unwise to exalt either the gun or the rifle at the expense of the other. Success is to be attained by the wise cooperation of the two principal weapons of defense—the rifle and the gun.

The erection of rear caponiers for the guns in the forts marked an epoch in fortress warfare. Add sheltered galleries for the infantry and machine guns and you will make the fort impregnable.

As a point of support, to guard the interval and prevent it from being taken, the fort must be supplied with a proper garrison and armament to fulfill its purpose. The artillery duel therefore no longer forms a part of its rôle, and guns of large caliber to oppose the batteries of the enemy are unnecessary. To mount large-caliber guns in it and to enter into combat with the siege batteries will invite the enemy's fire and subject it to all the disagreeable consequences. At Port Arthur large caliber guns were placed in all the forts, and they took part in firing against the siege batteries. In answering them, the artillery of the attack fulfilled three objects at the same time: It fired at a battery, it damaged a fort, and it caused great losses in the infantry garrison.

proof

1885
mistake

In order to destroy a battery, the guns must be struck, for which a large number of projectiles is necessary. When several thousand projectiles are fired at a fort containing a battery, only a few hit the battery. The greater number fall on the parapets and into the parade, causing damage and loss of life. The battery can continue its work by replacing damaged guns, but the damage done to the fort, though it may in great measure be repaired during the night, increases all the time, and the fort may be brought to such a state that at the moment of the assault it will no longer be in a condition to fulfill its function. To bring about this end is the aim of the attack. Why play into the enemy's hands?

If a large caliber battery has not been placed in a fort, but outside of it, the enemy will have to divide his fire and direct part of it against the fort and part against the battery. The number of projectiles falling in the fort will be smaller, and the damage and losses will be less.

To keep the fort intact until the assault is the great object of the defense. Now if the fort begins to show its hand before the proper time by firing, for example, at moving trains, it will immediately draw the enemy's fire. It would appear, therefore, that reconnoitering guns should not be mounted in forts. Such guns may well be placed in the vicinity of the fort, where they can fulfill their function with success. They are much safer outside the fort than within, because they may be better concealed, and safety lies in concealment. That such is really the case is shown by telephone message No. 2, sent only four hours after the beginning of the first bombardment, which says: "At Fort No. III all the large guns are damaged."

In order to come to a conclusion as to the changes which are desirable in our forts, we shall now describe one of the Port Arthur forts and invite attention to defects which became evident during the siege.^a

^a The appended sketch of Fort No. III, brought from Port Arthur, has no notes on it. The lack of a full sketch does not allow us to correct this defect. Moreover, as may be seen from the description, the true condition of the fort in detail does not correspond with the sketch.

Fort No. III was built on the summit of a hill at the end of a spur projecting almost perpendicularly from Dragon Ridge. The summit of this hill is separated from the ridge by a small saddleback. It presented an area sufficient for the construction of the entire fort. However, probably on account of the desire to improve the condition for firing against the front slopes of the hill, the fort was placed somewhat to the rear, and hence part of the gorge ditch had to be made in a fill.

The fort consisted of a front face, two flanks, and a gorge, which was somewhat broken in the center. The front ditch, 28 feet wide and 21 feet deep, was cut entirely through solid rock, its sides being almost vertical, but the flank ditches were unfinished. They were deep at the angles of the front face, but reached the ground level in the gorge, having at the gorge angles a depth of only 6 feet. The gorge ditch was 21 feet deep at its middle part, but was shallow at the angles.

The ditches were defended from casemates in the counter-scarp in the angles of the front face. In the right angle were two casemates with embrasures on different levels, because the bottom of the flank ditch was 7 feet lower than the bottom of the front ditch. Access to these casemates was gained through the postern. It was the intention to construct a gallery from the center of the postern to the left casemate, but work had only commenced upon it at the beginning of the siege and the only communication with the left casemate was through the left flank ditch.

The postern ended in the parade in a bombproof casemate consisting of two parts, one designed for use as a magazine, the other as a shelter for the counter-assault guns.

This shelter was separated from the ditch by the main rampart 35 feet thick. This rampart consisted of the natural solid rock, which was covered with 2 or 3 feet of earth during mobilization. In the center of the parade, adjoining its flank, were concrete emplacements for four 6-inch guns. In order to fire over the front rampart an elevated position was necessary, and the emplacements were therefore placed on the summit of the hill. The battery parapet consisted of solid rock, which was covered during mobilization with earth. The front rampart of the fort should have been lowered. This, however, had not been done when war broke out and

it was impossible to do so during the period of mobilization, as stones and gravel, dug out of the front ditch, had been thrown out forward, and, thus increasing the height of the glacis, had made at the same time a dead area in front to a distance of 1,200 paces from the fort. Hence, only the glacis and the approaches beyond 1,200 paces could be fired upon from the infantry breastworks. To have cut down the ramparts would have increased the dead area in front of the fort.

It was considered advisable to leave the rampart as it was for covering the glacis and to cut down the glacis as much as possible and place entrenchments at its base to cover the dead area in front. To enable the infantry to remain at their breastworks when the battery was firing a small ditch was cut in the rock, which enabled the men to fire in a sitting position.

The gorge was immediately in rear of the battery, a casemate for the garrison being under the gorge parapet. This casemate was finished and consisted of a long corridor 9 feet wide and 12 feet high. It had windows 2 feet 4 inches by 3 feet 6 inches which looked into the gorge ditch. There was one exit into the parade through the postern, covered by a grating. The casemate was parallel to the front face and its exit could be covered with fire from the right and left. The exit was protected by thick traverses on both sides. The gorge parapet was erected during mobilization, and, in order to complete the work more rapidly, its inner face was revetted with cement barrels filled with stones. In the gorge ditch the gorge caponier adjoined the casemate. Through the upper part of the caponier there was an opening affording communication from the interior of the fort to the rear by means of a small bridge thrown across the ditch. This upper part of the caponier was arranged for flanking the approaches on the left to Redoubt No. 3 and on the right to Fortification No. 2, and for this reason the entire platform of the caponier was surrounded by parapets 3 feet high.

The left flank of the fort was clearly visible from the summit of Takushan. When the enemy occupied this hill he could count men standing on the banquette of this face. It was necessary to provide cover, therefore, and having in-

creased the width of the banquette, a rear traverse was erected along the entire flank. On the right flank, which was enfiladed from Fenghuangshan, transverse traverses were constructed at intervals of 14 feet. Along the entire firing line embrasures of sand bags were constructed. After the battle of Nanshan, in which the advantage of light shelters against shrapnel was demonstrated, we began to construct such shelters in the forts. Orders were therefore given to cover the interval between the breastwork on the left flank and the rear traverse with boards and a layer of earth 2 feet thick and the intervals in a similar way on the right flank. Thus a kind of gallery was constructed on each flank.

The following measures were taken to destroy the dead area surrounding the fort:

1. The glacis was cut down on the right and in front.
2. A trench was dug in front at the base of the glacis.
3. A trench was begun on the glacis along the entire left flank.

The glacis was cut down on the right flank, which permitted the bottom of the ravine to be covered by the fire from the breastworks on this flank. It was impossible to cut off the entire glacis from the front face, and only part of it was removed. The base was surrounded by a heavy intrenchment. The right of this intrenchment ran close to the ditch above the casemate, while the left ran along the entire left flank to the Chinese wall. Only thus was it possible to cover the approaches nearest to the fort. At each of the four salient angles of the forts were barbettes, each barbette mounting two counter-assault guns. However, there was a shelter for two guns only. The exit from this shelter to the right barbette, which was covered by a grating, could be enfiladed at right angles from the right. The possibility of this struck the commander before the beginning of the siege, and he had it covered by a traverse made of sand bags.

The exit toward the left barbette was 12 feet below the platform of the barbette, and the ramp to the barbette was very steep. Drills in the middle of June, before the beginning of the siege, showed that it would be very difficult to run the gun from the shelter to the barbette. Consequently, taking advantage of the abrupt rocky face of the banquette

slope, a platform was made and the counter-assault gun was kept here under cover of the rock.

The gorge was almost on a level with the front face, but the rear part of the parade, between the gorge and the battery, was from 2 to 3½ feet higher than the front part between the breastwork and the battery. Hence rain water from the entire parade ran to the front, and, having no outlet, flowed through the shelter and thence through the postern to the casemate and inundated the lower story and drove the inmates into the ditch through the narrow embrasures. The trouble was serious. The casemate was built for one company on a peace footing. The company on a war footing had not sufficient room and occupied the shelters and the postern. There were no shelters for the officers, no storerooms, no kitchen. The officers were, therefore, quartered in the flanking casemates and the magazine. In the covered passage to the casemate barrels with water and the two remaining counter-assault guns were placed. Here also the storeroom for mines and hand grenades was established, and one corner of the casemate was partitioned off for a kitchen.

When the garrison was increased in view of the impending attack a row of sleeping shelves was added. The overcrowding and the closeness of the atmosphere were terrible. The casemate was without means of ventilation and was lighted by kerosene lamps, which produced soot and stench and thus aggravated the conditions. There were no latrines near the casemate, and the gorge ditch of the caponier, at the end where no firing was taking place at the time, was used by the men. There was an exit from the casemate into the ditch in the direction of Fortification No. 2, but there was no exit to the rear from the ditch. We felt grateful toward the Japanese when they made a breach in the gorge counterscarp and thus transformed it into a convenient exit. A telephone was established in the casemate, connected by an overhead line with the headquarters of the section and with the general line. Such was the condition of the fort at the beginning of the siege. It held out for five months and suffered assaults and all the consequences of progressive attacks.

The following discussion and conclusions are based upon experience gained at this fort.

LARGE CALIBER GUNS IN FORTS.

As soon as the first bombardment began at 6 a. m. on August 19, the 6-inch battery in the fort began to reply. Its open and elevated situation, its well-defined position in the center of the fort, and its visibility from afar soon brought about such a condition that General Gorbатовski, commanding the east front, telephoned at 10 a. m. to the commandant, "All the guns in Fort No. III are damaged." The battery was silenced, but the enemy continued to bombard it. Grenades and shell were fired alternately with shrapnel. It was evident that the enemy had decided not only to prevent the battery from opening fire again but to destroy it.

The Japanese fired very accurately, and seldom, indeed, was a bad shot observed from the fort. Every shot which fell short hit either the scarp, the parapet, or the parade, destroying embrasures and screens and wounding and killing the men. Every shot which went over was caught by the gorge. When a projectile hit a barrel the stones which filled it flew in all directions like the spray of a fountain. It was seen at once what harm may be done to a fort by having a silent battery in it serving as a target. We now came to the conclusion that the mounting of large caliber guns in a fort for use against the siege guns of the enemy is a fatal error.

The guns which were damaged during the first bombardment were repaired and the battery continued in service until the end. Often when a moving target was seen at a distance, as, for example, a train, cavalry, or an infantry column, the battery was ordered to open fire against it. But as soon as the muzzles of our guns were elevated the enemy saw them, and by the time we had fired a few shots he had answered with an overwhelming fire. The battery was quickly silenced, not only without having injured its target, but without having found the range. This led to the conclusion that reconnoitering guns should not be mounted in forts, and when mounted elsewhere should use indirect fire. Indirect fire is slow and ineffective only when there has been a lack of practice in time of peace. If the personnel has been prop-

erly trained, it may be used with great effect, just as though the target were well in view from the guns.

The first desirable change is the removal of large caliber guns from the forts.

NECESSITY FOR TURRETS FOR OBSERVATION AND GALLERIES FOR THE INFANTRY.

We have already stated in Chapter IV that when the Japanese columns advanced to storm the fortress none of the forts discovered the movement in time. It has also been stated that the garrison of Fort No. III did not know when an adjacent fortification was taken and gave it no support. Fort No. II, which attempted to assist the fortification, soon had 310 out of 350 of its garrison disabled, and its five guns and two machine guns damaged. In the same chapter we also stated our second conclusion, to wit, the necessity, in forts, of turrets for observation, concrete galleries for the infantry, and machine guns and concrete caponiers.

SHELTERED COMMUNICATIONS IN FORTS.

The garrison of the fort was divided into two parts: One platoon was placed in the shelter for the counter-assault guns, under the front face, and three platoons were placed in the gorge casemate. Here also the commandant of the fort had his headquarters. The shelter and the casemate were connected by telephone, but this connection was soon interrupted. The only communication between the separate parts of the garrison was across the parade, a distance of 120 paces.

During a bombardment the men on duty had to go to the casemate for food and orders, and to the ditch. Many were killed or wounded on the very first day. The survivors preferred to suffer hunger, and abstained from going to the ditch until the end of the bombardment. Such abnormal conditions lasted during each of the bombardments, when the casemate in the gorge and the shelter in the front part of the fort became, so to speak, two islands without any communication. When the enemy approached and occupied the glacis, communication even in time of lulls grew impossible and a covered passage had to be provided by zig-zags through the parade. Shells and mines destroyed the

zigzag every day and it was very difficult to repair and deepen it through the rock.

We now saw the need of a safe covered passage between the gorge casemate and the shelter for the men on duty at the front face.

SHELTERS FOR COUNTER-ASSAULT GUNS.

The artillery armament of the forts, which must consist of field guns only, is divided into two parts: The armament of the rear caponier, which is used to defend the intervals and support the neighboring forts, and the counter-assault guns, which are used chiefly to repulse assault against the fort and the adjacent works. These guns are supposed to be kept in special casemates or shelters until the assault, whence they are run to the barbettes when the enemy is near. These barbettes are at the salient angles of the fort.

It has been said that Fort No. III had but one shelter for two guns, erected in the center of the front face. The exits were at a distance of 88 feet from the barbette. The elevation of the barbette platforms above the exits from the shelters was 12 feet. This elevation and the great distance of the barbettes from the shelters made it very difficult to run the guns to the barbettes. In fair weather 10 men were necessary for this work, and from two to two and one-half minutes were required. In rainy weather, from 16 to 20 men were necessary and three minutes were required. To remain such a length of time under fire meant the loss of all the gunners. This is why from the very first days of the bombardment the artillerymen declined to return the guns to the shelter. The guns were, therefore, left in the open, and the shelter was occupied by the infantry. This shelter had another great defect. The exit was enfiladed from the direction of Takushan and was even visible from its summit. When we saw this we screened it with a traverse. On the first day a bomb fell in a corner of the exit and another knocked down part of the traverse, and we hastened to close this exit. There were similar hits in other forts, accompanied by casualties. Such exits are always filled with men on account of the overcrowding and bad air in the casemates and the impossibility of going to the parade for a breath of fresh air. Thus 50 men were

at one time put hors de combat at one of the forts and 7 at another time. Hence we came to the conclusion that the exits of shelters for counter-assault guns should be as near the barbettes as possible and at the smallest possible distance below the terreplein of the barbette.

In the construction of shelters and casemates the following rule must be strictly observed: The possibility of the enemy's reaching the exits of covered passages by oblique fire must be carefully considered and these exits must be made absolutely safe from all fire. If this rule is not observed, the covered passage, however useful in itself, will become a death trap.

ARMAMENT OF THE FORT.

We have already said that the armament of a fort should be limited to that required to repulse assault and that such artillery should not go into action until the enemy is near at hand. The guns should open fire at the instant the enemy rushes forward in force to the assault, the last shot being fired as the mass mounts the breastworks. Thus the time of operation for these guns is very short. In order for them to inflict great losses, they must fire many shots in a short time, and must perforce be rapid-fire guns. The old field guns, used by us for this purpose, were unequal to their task. All such guns should be replaced by rapid-fire guns. Although they are habitually kept in shelters, counter-assault guns are run up to the barbettes for action, and their position in action thus soon becomes known to the enemy who will endeavor to avoid them.

The assault on Fort No. III on October 29 furnishes an excellent example. The Japanese, having occupied and crowned the glacis and having taken possession of the counterscarp galleries, did not storm the front face where we had four counter-assault guns, but attacked the left flank of the fort notwithstanding the fact that it was supported from Redoubt No. 3.

It is very difficult to change the position of guns at the moment of assault, as in storming the breastworks the enemy fires at the interior of the fort. It is therefore very desirable to have, in addition to rapid-fire and machine guns for use at definite places, some mobile machine guns, which may be taken quickly to the breastworks or elsewhere.

The opinions of defenders of the fortress vary with regard to machine guns as weapons to repulse assault. Some maintain that the counter-assault guns should be entirely replaced by machine guns, while others hold the opposite view. There is no doubt as to the fact that the machine gun is a powerful weapon to repulse assaults, but the weapon opposed to it is no less powerful and simple. During the assaults on Redoubt No. 3 the Japanese carried along with them bags, shields, and breastplates, and, covered by these, crept forward. The machine gun could do nothing against enemies thus protected, while case or shell would have been very effective.

It would be unwise, we think, to discard the counter-assault gun, but when the enemy appears on the breastworks, the rôle of this gun is at an end, at which time the fire of a great number of machine guns is decisive.

Sentinels may be provided with machine guns to great advantage, as was demonstrated at Fort No. III. Machine guns are also excellent for flanking ditches, but their greatest use is in the defense of the intervals.

The small 37-mm. guns taken from the ships were also very effective. They were placed on the lateral faces and were used for firing at single men and groups at ranges of about $1\frac{1}{3}$ miles. At such ranges rifles and machine guns are ineffective and 3-inch projectiles ought not to be expended for such purposes. On the other hand ammunition for 37-mm. guns is easily and cheaply supplied, and their fire is effective at such ranges.

CASEMATES FOR THE GARRISONS OF FORTS AND COMMUNICATIONS OF FORTS WITH THE REST OF THE FORTRESS.

The casemate for the garrison was located under the gorge rampart. It is difficult to find a better place in a fort, as far as security from projectiles is concerned. But such casemates as we had at Port Arthur should not be tolerated. Except that they were secure, nothing good can be said of them. They were narrow, small, dark, close, ill ventilated, without officers' quarters, storerooms, or latrines, without covered passages, either with the front face or to the rear, and with only one exit into the parade and one into the ditch.

The unsanitary features caused various diseases; the lack of officers' quarters compelled the officers to occupy the passage in the gorge caponier among the guns; the lack of storerooms forced us to store food supplies, ammunition, hand grenades, pyroxilin, and Whitehead torpedoes under the men's bunks and to fill the covered passages with barrels of water; the lack of latrines caused great hardship; and the want of safe communication with the rear of the fort and with the front face caused many useless wounds and deaths. The fact that the casemates had but one opening into the parade and one into the ditch needs no comment. It was responsible for the loss of Redoubt No. 3 on December 31, when one of the exits was closed by the enemy's fire and the other was closed as the result of an explosion. Thus the garrison could not get out to meet the assault; the work was quickly taken and the garrison made prisoners.

Some of the engineers say that this example should not be quoted, as the destruction of the exit into the gallery was the result of the chance explosion of the small grenades stored near the exit. The cause of the explosion is immaterial. The fact remains that the exit was blocked and there was no other, and the redoubt was deprived of its defenders. Unless these defects are eliminated casemates have no right to the name and are only a kind of shelter. Casemates should be provided with two covered passages into the parade, an underground communication with the shelter of the front face and flanks, two open exits into the ditch, and one underground passage from the rear of the fort to the nearest natural cover.

When the enemy is assaulting a fort he attempts not only to overwhelm the fort with fire, but also to prevent reserves from reaching the fort. Hence, when storming columns approach, the fire is directed to the center of the fort and to its communications with the fortress.

On August 22 General Kondratchenko, while on a rocky ridge about 300 paces from Fort No. III, sent me a note at 11 a. m. by his orderly, but the fire against the fort and along the road in the rear was so fierce that the orderly could not reach the fort and brought the note to me only at 4 p. m. No supplies could reach the forts during such firing, and we were absolutely cut off from the rest of the troops. Reserves

sent to the forts never reached them intact. Thus during the assault on Fort No. II, only a little more than half of the reinforcements sent, reached the fort, and a similar fate befell the men sent to Fort No. III.

A covered passage was constructed in October from the gorge ditch of Fort No. III to the nearest hill and only by means of this passage was communication possible with the fortress; but water could not be brought to the fort until Captain Debroff, of the engineers, laid pipes through this passage. The isolated condition of the fort had a most depressing influence upon the garrison, while the artillery often remained without ammunition, the engineers without materials, and the entire garrison without bread and water.

It must be added to this that the only opening into the ditch was at that time no longer practicable. Communication between the casemate and the covered passage on the other side of the gorge ditch was effected by creeping through a small window of the casemate. It was then necessary to run across the ditch, which was covered by fire from Japanese trenches on the glacis of Redoubt No. 3, and climb up the destroyed counterscarp to get to Captain Dobroff's passage. This illustrates clearly how valuable would have been an underground passage under the bottom of the ditch to the rear. Having safe communication with the fortress, the garrison would not have felt isolated from the reserve, the spirits of the men would have been raised, their strength revived, and the defense would have been prolonged.

SHELTER FOR THE MEN ON DUTY.

In order to have the men as near as possible to the firing line, the garrison of the fort was divided into two parts; three platoons were in the casemate and one occupied the magazine and the shelter for the counter-assault guns. Thus the shelter for the guns served also as shelter for the platoon on duty. Not having been designed for this purpose, however, it had none of the conveniences required for an inhabited place—no window, no door, no stoves, no ventilation, no latrine. It consisted of a dark cell, with one exit covered by a grating. At the other end of the shelter was the entrance to the flanking casemate. There was a continual

draft, which made the lamps smoke and brought sickness and colds.

The shelter for the men on duty should be constructed especially for the purpose and should fulfill all the requirements for gorge casemates, from which it should differ only in size. This shelter should be placed at the middle of the front face. It should have an exit into the parade and should be connected by galleries with the shelter for the counter-assault guns. In these galleries there should be manholes from place to place to enable the men to run quickly from the shelter and climb out upon the infantry banquette. In order that these openings should not take up any room on the firing line, light slides in grooves should be provided to cover them.

A small cut is made in the concrete parapets for the elbow, and separate shields against shrapnel and bullets are affixed for each man by means of hinges. The shield is kept down habitually and is raised during firing, when it is held in position by a support. The openings from the galleries likewise furnish egress into the parade. In order that fragments of projectiles may not get into these openings, they should be closed by sliding doors. The dimensions of the galleries are 6 by 2 feet.

TELEPHONES AND SIGNALS.

We have already spoken of the necessity of turrets for double sentinels for observation to the front and flanks. If the enemy appears in small numbers, the sentinel on duty should be able to drive him back by machine-gun fire. When large forces appear the sentinel should immediately notify the commandant. He can not leave his post for this purpose, nor can he send the other sentinel, as he would almost inevitably be killed on the way. Great assistance may be derived in such cases from the use of telephones connecting the observation stations with the fort, and from electric bells connecting the observation stations. As soon as a sentinel observes movements of the enemy he should be able to attract the attention of the other sentinels by means of the electric bell and to advise the fort commander by telephone. It was our own fault that we failed to utilize these simple but very useful aids. At Port Arthur one

sentinel was stationed on the breastworks under cover of traverses to observe through an embrasure, while a second sentinel observed the first from a secure place near the casemate, delivered at the casemate information which he received, and reported the fact in case the sentinel was killed or wounded. There were instances when both sentinels were killed and the fort remained without observers. The enemy managed to take advantage of these intervals, even when they were very short. To fulfill its purposes, observation must be uninterrupted and the results must be reported without delay. This necessitates bombproof turrets for the sentinels and secure telephonic communications.

Thus each fort must have its own telephone system. It is superfluous to say that this system must be installed in time of peace and that it should be absolutely secure from injury. Four or five telephones should be placed in the casemate, with wires branching off to the posts of observation, the shelter for the men on duty, and to the rear caponiers.

Each fort should also be connected by telephone with the neighboring forts and with section headquarters. This line must also be absolutely secure from injury.

Fort No. III was connected with the fortress by an overhead line which was damaged a countless number of times—and always at the most important moment—during an assault. The fort was also connected with the mining station in front by a telephone cable laid underground at a depth from 1 to $1\frac{1}{2}$ feet, but the cable refused to work on rainy days on account of defective insulation.

THICKNESS OF CONCRETE WALLS.

The walls of concrete casemates, shelters for counter-assault guns, flanking caponiers, and other casemated buildings of forts at Port Arthur were 3 feet thick. They were built to resist 6-inch howitzer shells, and they successfully stood the test. I had an opportunity upon more than one occasion to observe the effect of such hits. In most cases when a 6-inch shell hit a wall and exploded, it made a depression 3 or 4 inches deep, having a diameter of about $1\frac{1}{2}$ feet. In striking upon a roof it made a funnel-shaped hole 4 or 5 inches deep and about $1\frac{1}{2}$ feet in diameter. If a second projectile hit in

the same place, it deepened the hole by 1 to $1\frac{1}{2}$ inches, increased the diameter to 2 feet, and broke off a piece of concrete on the inside from 1 to $1\frac{1}{2}$ inches thick. There were cases where several shells hit in the same place. Each time the damage was increased, and after several hits cracks appeared on the inside. The holes made by the projectiles on the roof and on the sides were easily repaired during the night.

The greatest damage was done by shells hitting the angles of buildings. Large pieces of concrete were broken off, $3\frac{1}{2}$ feet long and $1\frac{1}{2}$ to 2 feet wide. It was impossible to cover such places with concrete, for, before the concrete had time to set it would be broken off by projectiles striking in the same place or at other points. The destruction of concrete structures began at the corners and was completed by the gradual increase of this damage. A layer of earth of $4\frac{1}{2}$ to 5 feet entirely secured concrete structures against injury from 6-inch howitzer projectiles.

Matters changed, however, when the 11-inch mortars appeared on the scene. The projectiles from these mortars penetrated roofs 3 feet thick, and there were cases where roofs were perforated by these projectiles without their exploding. Many engineers attribute this to the bad quality of the concrete. As I did not construct the Port Arthur forts and had no occasion to test the concrete used, I can not give a positive opinion upon this question. Yet it seems to me that such is not the case. If the concrete roofs resisted 6-inch shells, for which they were built, the concrete must have been of good quality. If they could not withstand the impact of 11-inch shells which did not explode, this must have been due to the lack of thickness of the walls and not to the poor quality of the concrete.

The resistance of concrete is similar to that of armor, the thickness of which must be increased with the increase of the diameter of the projectile used to attack it. In the case under consideration the diameter of the projectile was almost doubled, and the weight of the bursting charge was increased while the thickness of the concrete wall remained the same. Naturally the wall must be penetrated. To resist the larger projectile the thickness must be increased. How much should it be increased? It would

appear sufficient to double it; but experience at Port Arthur showed that with a thickness of 5 feet and two hits in the same place there remained a layer of only about $1\frac{1}{2}$ feet of concrete. This layer was not solid and was easily perforated by a third projectile. These facts and the possible appearance of still larger projectiles with greater bursting charges lead us to recommend that concrete walls be built to resist the maximum effect of three 11-inch projectiles striking in the same place. This would require a thickness of 9 feet. Such a great thickness may appear unnecessary at first sight, but it should not be decreased, because it will not always be possible to cover the concrete with earth.

The influence of a layer of earth in increasing the resistance to 11-inch projectiles was very great, as may be seen from the following examples:

1. At Fort No. III a layer of earth 3 feet thick was placed over the concrete traverse of a battery. An 11-inch projectile struck it, exploded, and made a hole 9 inches deep in the concrete and a hair crack on the inside of the traverse.

2. The roof of the postern and the covered passage to the casemate consisted of 5 feet of concrete. It was covered with a layer of earth $3\frac{1}{2}$ feet thick, over which was a layer of gravel and cobblestones $1\frac{1}{2}$ feet thick. This roof was frequently struck by 11-inch projectiles, which made funnel-shaped holes in the top layer only. The concrete remained intact until the last day of the siege. The holes were quickly filled after each hit. Upon one occasion an 11-inch projectile struck the roof and was followed by a 6-inch projectile in the same place. The concrete did not suffer.

3. A concrete roof was covered with 5 feet of clay, each layer of 1 foot being thoroughly tamped. Several 6-inch projectiles struck this roof without affecting the concrete.

These examples show clearly that a layer of earth not only absorbs the force of impact of the projectile, but weakens the effect of the explosion. It was also made clear that with a thickness of 5 feet of clay the clay did not have a tamping effect on the explosion of the shell. Observation on other hits in layers of 14 feet of clay did not show any tamping effect.

Hence it would appear that the proposed thickness of 9 feet for concrete walls may be somewhat decreased; but neverthe-

less great danger is incurred in decreasing it. We have already mentioned in Chapter VI that Germany has constructed 12-inch howitzers and another country is reported to be constructing 18-inch howitzers. What monstrous bursting charges their projectiles will have! Must we not anticipate the progress of artillery? Must we not be prepared to oppose due resistance to such projectiles? Is it not better and cheaper to construct at once than to reconstruct, add, and reform later? We must not forget that the Germans say with reference to their howitzers, "Wir werden alles vertobacken" (We will upset everything). They probably have good reason to say so. The construction of bomb-proof shelters must be based upon definite information. We have already made it apparent that sufficient information is available for this purpose.

It seems strange that the thickness of roofs varies according to the character of the building. Thus the roofs of magazines are thicker than the roofs of casemates, which in turn are thicker than the roofs of shelters, posterns, and covered passages. Are the constructors guided by the size of the arch or the importance of the building? The arch depends upon the type of the building. There are casemates 18 feet wide and other 9 feet wide, the thickness of the roofs being the same.^a As to the relative importance of buildings, I do not understand why a magazine should be more important than a casemate, or why a casemate should be more important than the postern and covered passages. If the roof of the magazine is perforated, several rounds of ammunition may be destroyed; if the roof of the casemate is perforated, the greater part, if not the entire garrison, will be killed or wounded; if the covered passages be destroyed, the garrison will be confined to the casemates, and this may happen even with two outlets.

We do not consider the postern and the covered passages as secondary appurtenances to the casemates. They are as important as the casemates themselves. The following facts should not be forgotten: Each magazine and each casemate has a thick covering of earth on top and in rear; the covered passages are generally near the surface and often have no covering of earth, and the layer on the postern grad-

^a Such was the case in many buildings in Port Arthur.

nally decreases as it approaches the covered passages. Taking this into consideration, it would appear more rational to increase the thickness of the walls of the postern rather than to decrease it. The walls of shelters for counter-assault guns and rear caponiers should also be made thicker. We believe that the successful defense of the intervals and of the forts rests with the artillery and the infantry. Should we, in order to save a thousand roubles, decrease the thickness of walls by 1 to $1\frac{1}{2}$ feet and risk the loss of the garrison?

We conclude that the so-called bombproof shelters in forts should be bombproof in fact; that they are all of equal importance; that no one should be made strong at the expense of the others; and that therefore the thickness of their walls should be everywhere the same. In order that these walls meet not only present requirements, but afford adequate protection ten years hence, they should be at least 9 feet thick.

DITCHES AND OTHER OBSTACLES.

It has been said at the beginning of this chapter that in order that a fort may be capable of fulfilling its rôle as a point of support, it should have sufficiently strong obstacles against assault. The siege of Port Arthur showed clearly that the best obstacles, the most difficult to surmount, are deep, wide ditches with abrupt sides. If such ditches have a flanking defense, it will be so difficult to cross them that the enemy will scarcely attempt it. The Japanese did not attempt to cross them.

On August 21 everything was ready to assault Fort No. II. The ladders, anchors, etc., were prepared, and three regiments with these accessories were hid in the dead area at the foot of the glacis. The commander of the Twenty-sixth Regiment reported this fact to the commandant of the fortress. Only 40 defenders remained in the fort. The Japanese would not risk an assault during daylight and awaited darkness. But they did not assault at night and retired at 8 p. m., leaving their ladders behind. According to report, they retreated because they had received information through their scouts that there were caponiers in the ditch. We believe this explanation, as the operation could not have been a demonstration, for the preparations for assault were too great.

The Japanese explain their retreat by alleging that their ladders were too short to span the ditch. These ladders were 21 feet long, while the ditch was 28 feet wide. But they were long enough to reach the bottom of the ditch, which was only $17\frac{1}{2}$ feet deep. The Japanese did not dare do this, but preferred to spend two months on progressive attacks in order to be able to destroy the flanking caponiers and take possession of the ditch. It would appear that with the caponiers destroyed and the counterscarp surmounted there remained but a trifle to be done to scale the scarp and take the fort. But the rocky scarp served its purpose. Repeated efforts to reach the breastworks by means of the ladders placed against the scarp met with failure, and the Japanese had to spend two months more in mining through solid rock to complete the passage of the ditch. The difficulty of crossing a ditch was shown when the Japanese in storming Aqueduct Redoubt reached the ditch, which was neither deep nor covered by fire, but could not scale the earthen scarp and were repulsed in the night by sixteen of the relief on duty.

These facts speak in favor of ditches, and it is evident that the wider and deeper the ditch, and the steeper its sides, the more serious will such an obstacle be to the storming party. Hence we believe that modern German fortresses with small triangular ditches and sloping scarps would not be capable of offering formidable resistance.

By chance Fort No. III had very nearly vertical scarps and counterscarps almost as steep, thanks to the solid rock. In most of the European fortresses the concrete counterscarp is almost vertical, fences being substituted for the scarps. Is this wise? During the first bombardment of Fort No. III we frequently observed the Japanese firing against the scarp with 6-inch howitzers. They probably did not know that it was a monolith and were trying to destroy it. In the middle of the scarp a small depression had been made, which was afterwards filled with earth and stones. Many projectiles struck here, but during a month they only succeeded in breaking the depression down about $2\frac{1}{3}$ feet at the top.

It seemed to us, then, that if the scarp had consisted of earth with a fence it would have been easy to destroy it. Each shell would have reduced the slope and when the counterscarp had fallen into the hands of the Japanese the

final destruction of the fence and capture of the fort would not have been difficult. Such ditches would offer only half the resistance offered by the ditches at Port Arthur. The determination of the best type of scarp is a most important problem. In my opinion we should return to the vertical concrete scarp. The enemy will endeavor to destroy it by curved fire, which it must therefore be constructed to withstand. Economy might be considered by constructing it in offsets thick at the top and thin at the bottom. For protection against fire the ditch should be limited in width to 35 feet and the glacis should be as high as possible, or the ditch might be dug by offsets, making it deeper at the scarp than at the counterscarp. Thus the half of the ditch next the scarp might be $31\frac{1}{2}$ feet, the other half being only 21 feet.

COUNTERSCARP GALLERIES.

One of the most important problems raised by the siege of Port Arthur is that of flanking ditches. The opinions of the defenders of the fortress and of engineers who were not at the seat of war vary greatly, and many controversies have arisen. Some assert that the counterscarp galleries did not fire a single shot and that, in general, the siege has proved that such galleries are utterly useless; others assert that the siege proved the great importance of these flanking galleries. Who is right? Should the flanking galleries be retained, and if retained should they remain unaltered, or should they be replaced by the old type of caponiers and half-caponiers near the scarp? To solve this mooted question it is necessary to determine what may be expected of the different types of flanking defenses and what will be required of them.

It has been stated that the counterscarp galleries of Fort No. II played an important rôle on August 22, forcing the Japanese to desist from the assault. The same results would have been accomplished by caponiers constructed in the ditch. The usefulness of the counterscarp galleries was not affected by the appearance of 11-inch mortars, but such would not have been the case with caponiers in the ditch. When we consider the accurate firing of the mortars which hit the target at the second shot (a gun at Fort No. III and a casemate at Fort No. II, on October 1), it is easy to see that

these half-caponiers would very quickly become untenable. We had an excellent example in the case of the gorge caponier of Fort No. III. It is true that much time was required to silence this caponier, but every gorge caponier is better covered than the caponier at the middle of the front face and the half-caponiers on the flanks. The complete security of counterscarp galleries from the effects of shell fire is a feature which should not be overlooked. Those who oppose counterscarp galleries maintain that the Japanese easily took possession of such galleries by exploding bursting charges over them and that the ditches thus remained without defense.

The fact that these galleries were so easily taken was our own fault. Thus, the first damage to the counterscarp gallery of Fort No. II was not caused by a Japanese shell, as is asserted by some, nor was it because the rear wall of the gallery was exposed to view by a small landslip. It was the result of the explosion of one of our own camouflets, which laid bare the rear wall.^a This suggested the idea to the Japanese of leaving their gallery and blowing in the exposed gallery from above.

At the counterscarp galleries of Fort No. III, conditions were not better. It has already been mentioned that there was a trench at the foot of the glacis of this fort. The right flank of this trench near the ditch was immediately above the roof of the gallery. After they had taken this trench the Japanese were able to reach the roof of the gallery easily. About two weeks before they took the trench orders had been given, in view of the approach of the Japanese to the crest of the glacis, to make a countermining gallery from the counterscarp gallery. It must be observed that the counterscarp gallery had been covered with a layer of gravel. In order to make the mining gallery it was necessary to cut a hole through the concrete rear wall and excavate the gallery in the gravel. Much gravel fell into the excavation from above and was carried out. The upper part of the counter-

^a "On the contrary, part of the rear concrete wall of the counterscarp gallery was bare, which betrayed its presence to the Japanese and presented a convenient point of attack for further mining warfare." *The Fight for Port Arthur*, appendix to Streffleur's *Militärische Zeitschrift*, page 149.

scarp gallery was thus exposed to view. Here again we exposed to the Japanese that which should have been concealed.

It is true that we would have gained only two or three nights had this not happened, but it is equally true that little energy was displayed in the defense of the galleries. This was due in great measure to the fact that little importance was attached to the galleries when the fort was building. At the beginning of the siege there were no guns in these galleries, the 57-mm. guns intended for them having been placed on the Chinese wall. In order to complete the equipment of the gallery of Fort No. III, we had to beg three 37-mm. guns from the marines.

Another example of the contempt in which the counterscarp galleries were held may be found at Redoubt No. III, where it was preferred to cover them with stones and cement rather than to lead out countermines from them. Is there any wonder that the garrisons defended them weakly?

It is alleged that the counterscarp galleries did not fire a single shot. This was because they completely fulfilled their purpose while they were in our hands without being required to fire. The enemy feared them and would not expose himself to their fire. He decided to take possession of them by a slow but sure process, thus preventing them from firing, after which he would be free to storm the forts. If fortress warfare be a struggle for time, the counterscarp galleries should be given credit for having kept off the enemy for two months and not for having failed to fulfill the end for which they were built.

The counterscarp galleries might certainly have been held longer and been more useful to the defense if more care had been given to their construction and if adequate measures had been taken for their defense. Little was done to fulfill these ends. A concrete work was sunk into the ground; the men sitting in it could see nothing; the garrison in the fort took little thought of it and did little to defend it; and now we say that counterscarp galleries are worthless. Such an opinion can be formed only in ignorance by men who do not comprehend what really took place. The problem is so simple that there should be no ground for contention. It is clear that half-caponiers, adjoining the scarp, and head caponiers may be subjected not only to enfilade and curved fire, but to direct fire, and may be quickly demolished. It

is equally clear that galleries in the counterscarp are protected from fire. The advantage lies on the side of the counterscarp gallery. As to the ease with which counterscarp galleries may be mined, it may be said that, if counter mines have to be laid for the defense of counterscarp galleries, they must also be laid for the defense of the caponiers, which may be mined almost as easily as the galleries. It is only necessary to capture the crest of the glacis, sink a shaft into the ditch, and drive a gallery across it.

For the mining defense of caponiers adjoining the scarp, it is necessary to dig a special gallery in the counterscarp. For the counterscarp galleries this work is easier, the construction of a countermining system being simpler and cheaper.

We therefore come to the conclusion that the defense of ditches must remain such as it was at Port Arthur, and that in constructing counterscarp galleries, galleries for countermining should also be constructed.

The interior dimensions of the counterscarp galleries were satisfactory. The front wall, which is not exposed to fire, need not be over 3 feet thick, but the thickness of the roof and of the rear wall should be increased to 9 feet, as two or three men can always creep unnoticed to the counterscarp even in the early period of an attack, place a dynamite cartridge of 50 or 60 pounds over the gallery and explode it. With 9 feet of concrete such an explosion will have no effect. To bring a larger charge would require such a large detachment that it would not be able to approach the gallery unnoticed.

THE INSTALLATION OF SEARCHLIGHTS IN THE FORTS AND THE ILLUMINATION OF THE DITCHES.

A special chapter has been devoted to searchlights. We proposed three searchlights for each fort, one large light in the fort itself and two small lights for the rear caponier.

It is impossible to specify the exact point at which the large searchlight should be placed. This depends in each case on the type of the fort and the configuration of the terrain. The first requirement for the large searchlight is that, in lighting the terrain around the fort, it should not illuminate the fort itself. This end may be attained by various

appliances. The second requirement is that ranging by the enemy on the searchlight should be rendered difficult by making it mobile, so that its place may be changed frequently. The infantry banquette, where it may be covered and where its rays do not fall on the fort, appears to be the best place for it.

The location for the dynamo depends upon the location of the searchlight. The dynamo may be placed in the shelter for the men on duty, or in one of the flanking galleries. It is desirable that the illuminated arc be as near 180° as possible, so as to be able to light up not only the terrain in front, but also the approaches to the adjacent forts.

The purpose, location, and operation of the searchlights for intermediate caponiers have already been discussed in Chapter VI, page 111.

The question of lighting the ditches has raised a controversy among the defenders of Port Arthur like that raised by counterscarp galleries. Some hold that the ditches should be lighted every night, while others maintain the opposite opinion. According to my personal observation this question should be decided as follows: In keeping the ditches constantly lighted we provide in a way for their immediate security, but we enable all who approach the top of the counterscarp to observe the ditch easily, and thus assist them to reconnoiter it and determine its width and depth, and the position of the counterscarp galleries, sentinels, etc. Moreover, the constant lighting of the ditches discloses the position of the fort from afar, for it is impossible to illuminate the ditches so that the enemy can not see the light from a great distance.

From this point of view, the constant lighting of the ditches is harmful. On the other hand, it is very desirable to be able to illuminate them at the moment the enemy enters them, so that the garrison can take in the full situation and the guns and machine guns operate with effect against the ladders and groups of the storming parties. The great necessity for this was shown at Fort No. III during the October assaults, when it was necessary to throw into the ditch burning sheaves of straw soaked in kerosene. Brilliant illumination at the opportune moment has a great moral effect; it encourages the garrison and spreads panic among

the assailants. Ditches should therefore be lighted during assaults, but not constantly. Moreover, they should be lighted from a counterscarp gallery, and a special embrasure should be made for this purpose.

COVERED PASSAGES.

Nothing proves better the necessity for the strictest service of security in the defense of forts than the history of the capture of the counterscarp galleries of Forts Nos. II and III.

The fact that the enemy could approach the very top of the counterscarp unnoticed and measure the ditch of Fort No. II and that nobody hindered him from putting bursting charges under the walls of the flanking casemates of the two forts and exploding them (this was done twice at Fort No. III) would appear to indicate clearly either that the security service of the forts in general and of the flanking casemates in particular was not of the best or that there was no watch whatever. Such criticism is unwarranted. The sentinels were stationed on the banquettes of the parapets and observed through the embrasures. On dark nights they could see nothing that was taking place in front at a distance of more than 40 or 50 paces, the width of the parapets and part of the glacis, and the enemy, taking advantage of the holes in the glacis plowed up by projectiles, could reach the top unnoticed.

It was impossible to place other sentinels nearer to the glacis, as there was no shelter for them. As early as August we saw the necessity for covered communications. The explosions under the walls of the counterscarp galleries, in October, confirmed us still more in this opinion and also confirmed the truth of Vauban's dictum that "covered communications are the eyes and the ears of a fort."

THE GARRISON OF THE FORT.

What should be the garrison of a fort? All the forts of Port Arthur were constructed for one company each, 200 strong. During the first period of the defense only one company was assigned to each fort but the garrisons of some forts far exceeded 200 men. Thus the company stationed at

Fort No. III consisted of 350 men, but even this number was insufficient.

One-fourth of the garrison of this fort was detailed every night for security service, one-fourth for duty, and one-fourth to repair damages, while the other fourth rested. At least 80 men were necessary for security service and the number detailed for this duty was never smaller. To repair damages 40 men were detailed until midnight and 40 after midnight. To distribute the work equally, the garrison should have four reliefs of 80 men each plus a certain number for interior service. Hence 350 men are required at the lowest estimate. We must also bear in mind that the garrison will suffer losses from the beginning of the siege. It will therefore be desirable to have in each fort two companies of 200 men each, or 400 men in all.

Assuming the firing line of the front face to be 280 feet in length and of the lateral faces 280 feet, and assuming 1 man for every 7 feet of parapet, we find that 80 men are required; adding one-fourth for the reserve, we see that 100 men are required for one relief. There should be four reliefs and the entire garrison should consist of 400 men. Such a garrison is necessary during the first part of the siege. During the period close to the assault, when the enemy is near the glacis and has his reserves in the second parallel, i. e., nearer to his advance troops than our reserves are from the fort, the garrison should be increased by at least one company so that it would number 600 men. Such were the measures required for the defense of the forts at Port Arthur. The failure to recognize the necessities of the case had immediate and fatal consequences for Fort No. II.

The entire garrison must be stationed in bombproof shelters. With the construction in forts of a separate shelter for the men on duty and of infantry galleries, in addition to the casemate, it will be possible to shelter the entire garrison. The gorge casemate should accommodate one company. It should have two exits, a separate room for the officers, a kitchen, and a storeroom. The height of the casemate should be such that a second tier of sleeping shelves may be added in time of mobilization, so as to accommodate an additional company.

THE PARADE OF THE FORT.

We have already spoken of the elevated battery in permanent emplacements at Fort No. III. We have also spoken of the injury done by the fire drawn by this battery. But there was one excellent feature connected with it. The battery parapet stopped many a projectile which would have fallen into the covered passage to the casemate. Although this passage was covered with earth on the side exposed to fire, yet the constant fall of large projectiles would probably have destroyed it and blocked the exit. When it became evident that the enemy was going to blow up the rampart this battery was utilized as a retrenchment for a second line of defense in the fort. The concrete of the emplacement was much damaged, however, and the trench constructed in solid rock in front was shallow, and the retrenchment could not hold out long. If better constructed, it might have been of great use.

The value of a retrenchment as a rear traverse with regard to the gorge became apparent. The gorge constitutes a defensive position against attack from the rear of the fort. Having sent troops to the rear of a fort to assault the gorge, the enemy will prepare for the assault by shrapnel fire from his batteries in front of the fort against the unprotected rear of the troops lining the gorge parapet. This was so evident at Port Arthur that it was decided that the infantry parapet of the gorge of Redoubt No. 3 should not be manned. A trench was dug on the gorge rampart 14 feet from the crest, so that the men were protected from the rear. A similar trench was dug on the left flank of the gorge of Fort No. III when the rear traverse was destroyed.

We conclude, therefore, that the gorge of the fort should be lower than the face and flanks and that it should be covered by a traverse as high as the front face or a little higher. This traverse will cover the rear of the gorge and serve as a retrenchment for firing against the parade in front of it. Between the retrenchment and the flanks, passages should be left, and a traverse should be constructed from the center of the retrenchment to the front face as a protection against enfilade fire and to localize the effects of shell bursting in the parade.

THE MASKING OF FORTS.

We have already said that measures to conceal the fort should be taken while it is under construction, as a fort which is not masked at the time it is building will never be completely masked. The means required to conceal it later will be different from what would be required during its construction. In the past no effort has been made to leave the configuration of the terrain as little altered as possible. Care was taken that the parapets should be of sufficient height and thickness and that a spacious parade should be formed in the interior allowing free movements unhampered by traverses, etc. The plan was begun by determining a theoretical and in most cases horizontal area as a basis to form the necessary number of mounds and depressions. Thus the site of the fort lost its primitive shape.

The parapets of the forts had to be higher than the surrounding terrain. If we add that the firing lines of the forts were always strictly horizontal, a configuration never met in nature, except in the case of water areas, it will readily be understood that forts could not be concealed by the most skillful use of turf. The slopes of the ramparts, presenting plane surfaces, were often joined directly to sharp ridges, easily detected by the shadows formed by the sunlight at various times during the day. The use of soft, rounded connections between the slopes was utterly ignored.

The system of fort construction must, therefore, be fundamentally altered. The site on which the fort is to be constructed should not have its configuration changed. A most irregular trace will sometimes be the result; the faces will be of different heights; the ditches may not be parallel to the ramparts; while the firing line, traverses, and retrenchments will have a wavy shape corresponding to the relief of the site, etc. The fort, however, if it conforms to the terrain, will not be easily detected and ranging will be difficult. The construction, moreover, will not suffer. The ramparts, traverses, and retrenchments will in many cases consist of the natural soil which is more solid and resistant than artificial earth construction. Mounds and depressions may be joined to each other and harmonized by the use of soft,

round connections counterfeiting nature. It should not be forgotten that the cost of earth construction in a fort generally forms only from 10 to 15 per cent of the entire expenditure. These measures, in addition to affording excellent concealment, will give great solidity to the ramparts and a better cover for the gorge, and will localize the effects of shell fragments.

Such measures are possible only in a hilly region, but in the construction of forts on level terrain it is equally desirable to mask them better than formerly. It is advisable to avoid a regulation height for ramparts, which in each case should not exceed the height required for firing, the depth of the parade being increased by excavation if necessary.

It will be difficult, under any circumstances, to secure entire concealment by such methods and it will therefore be necessary to plant trees. They should be planted not only in front but also in rear of the works, so that the trees in front may not stand out in bold relief against the sky. This measure will to a great extent prevent the enemy from determining the site of the works. Trees should be planted not only in the immediate vicinity of the forts but along the entire front.

CHAPTER IX.

(See Plates V, VII, VIII, IX, and X.)

PROJECT FOR A FORTRESS—PROJECT FOR AN INTERMEDIATE REDOUBT FOR ONE COMPANY.

The following plan for a fortress is suggested. It contains a résumé of all that has been said.^a

In order to protect the nucleus of the fortress from bombardment the line of forts has been advanced to 6 miles from the city. On account of local conditions, however, the distance from the city varies between $5\frac{1}{3}$ and $6\frac{2}{3}$ miles. The perimeter of the fortress is $35\frac{1}{3}$ miles. The distance between the forts does not exceed $1\frac{1}{3}$ miles. The distance between forts and intermediate redoubts varies between one-half and five-sixths of a mile.

In view of the local conditions some of the intermediate caponiers are located without reference to the forts. The intervals between the forts are equipped partly with parapets and ditches and partly with a parapet only. The parapet and ditch is used on comparatively unbroken terrain, the parapet only, on very broken terrain. The parapets are on the line of forts in places, but are generally about 120 yards in rear of the forts, passages being left on each side of the forts and intermediate redoubts for sorties and for troops entering or leaving the fortress. These passages are narrow, not exceeding from 50 to 60 yards, for the narrower the passage the more easily it may be defended, and, moreover, troops never leave or enter a fortress on a wide front. It is better to have numerous narrow passages rather than a few wide passages. The firing banquette of the parapet is greatly widened in places to form positions for counter-assault guns.

The ditches in front of the parapet have a flanking defense from 57-mm. and machine guns mounted in caponiers in

^aA section of the fortress is shown in Pl. VIII.

the ditches or in mobile armored turrets placed in the ditches or in the open. The ditches are protected by a glacis with a covered way for sentinels.

Immediately in rear of the parapets are casemated traverses for the troops on duty in the intervals, each interval of $1\frac{1}{3}$ miles being equipped with four half-company concrete casemates. About 120 yards in rear of the parapets, covered by folds in the ground, are two one-company concrete casemates for each interval.

In rear of the company casemates, but as near to them as possible, there is a metaled road protected by accidents of the terrain, with branches to the forts and redoubts. Continuous belts of trees run along the glacis and at its foot around the entire fortress. Roads and casemates should be masked in the same way if the terrain is open and the parapets do not afford concealment. The foregoing measures are necessary for the preparation of the infantry fighting position.

The road forms the outer limit of the artillery position. The batteries are distributed from this line to the center of the fortress. Close to the forts are the reconnoitering batteries and the mortar batteries, a little farther in rear the howitzer batteries, and still farther in rear the remaining long-range batteries of 6-inch Canet, 6-inch, and 4.2-inch guns. Each battery has from two to four guns. In time of peace the sites for the batteries are marked. Small concrete casemates are constructed for the gunners and magazines for a three days' supply of ammunition. Three or four batteries form a fire command. On the elevated points of the artillery position permanent observation stations are built for the fire commanders. They are constructed of concrete or are armored turrets. The batteries of each fire command are connected with each other and with the fire commander's station by underground telephone. Fire commanders' stations are connected by telephone with the observation station of the commander of the fortress artillery.

Each fire command has a magazine with sufficient ammunition for five days, located from 350 to 450 yards in rear of the batteries, in a well-concealed position. It is connected with the batteries by a portable railway. Well concealed in rear of the artillery position runs the main line of the fortress

railway, connected by radiating branches with the magazines and depots in the city and by branches of portable railway with all the magazines, with each front of the fortress, and with the metaled road.

All batteries, magazines, observation stations, roads, and railways are carefully concealed from the observation of the enemy. No expenditure can be too great to secure concealment, so well will it be repaid in time of siege.

The second line of defense is from 2 to $2\frac{2}{3}$ miles in rear of the first line of forts. It consists only of forts as points of supports, the intervals between the forts being fortified during mobilization by trenches and temporary works. Here greater economy may be exercised. The forts may be from $1\frac{1}{3}$ to 2 miles from each other. The parapets need not be constructed in time of peace, but it would be desirable to have a one-company concrete casemate in each interval. In establishing the second line one imperative requirement must be observed. The first line must be effectively covered everywhere by the fire of the second.

A permanent observation station for the commandant is shown on Height 95.^a This station is connected by underground telephone with the detachment headquarters. Detachment headquarters are likewise connected with section headquarters, which in turn are connected with the forts and redoubts. Metallic circuits are used and the system is independent of the artillery telephone system.

Three searchlights are placed in each fort, one on each redoubt and four in each interval between the forts. The smaller details are not shown in the plan.

PROJECT FOR AN INTERMEDIATE REDOUBT FOR ONE COMPANY.

The plan here proposed for an intermediate redoubt is based upon experience gained at the siege of Port Arthur.

The parade, in order to defilade it effectively, is sunk 21 feet; the ramparts are partly built up and consist in part of undisturbed natural soil. The work is somewhat elongated in depth, as it is constructed to conform to the terrain. As may be seen from Plate IX, the casemates for the garrison are under the gorge rampart. The separate casemates have

^a This height is not shown in the sketch.—Tr.

windows looking into the gorge ditch and doors opening into a rear covered passage. This passage communicates with the gallery under the retrenchment through an underground passage, with the infantry galleries on the faces, the scarp gallery, the gorge ditch, the counterscarp gallery by a passage under the gorge ditch, and with the passage running to the rear of the redoubt.

The gallery under the retrenchment has exits into the parade between the gorge rampart and the retrenchment, and between the front face and the retrenchment. It communicates with the shelter under the front face for the men on duty and with the infantry galleries on the flanks.

The shelter for the men on duty is a two-storied casement. The detachment occupies the lower story, while the upper serves as a shelter for the counter-assault guns. The lower story is connected with the passage to the scarp and counterscarp galleries.

The parapets on the front face are cut in the natural soil.

The flanks of the fort gradually decrease in height from the angles with the front face of the gorge, which is 14 feet lower than the front face. Being covered, also, by the rear traverse, the gorge is thus protected from accurate fire from the front. The rear traverse is prepared for infantry defense and serves as a retrenchment, the necessity for which was demonstrated at all the forts and redoubts attacked at Port Arthur. This retrenchment serves, moreover, as a background for the parapets in front, which will thus be less clearly defined than against the clear background of the sky.

The traverse running from the retrenchment to the front face is a protection against flank fire and localizes the effects of shell bursting in the parade.

Two barbettes for four counter-assault 57-mm. rapid-fire guns each are erected at the angles of the front face. These guns are kept in shelters close to the barbettes. The elevation of the barbettes above the platform in front of the shelters is only 8 feet. The slope is one-fifth, which allows the guns to be run quickly into position for firing. A whip may be used for this purpose, the block being secured in the barrette.

In the shelter for the guns there are separate rooms for officers and for the gunners, a small magazine, and a latrine. The detachment on duty, which consists of a platoon, is quartered in the lower story. The men mount by a stairway to the upper story and emerge through four exits on the banquette. The lower story communicates directly with the flank galleries and the gorge casemates.

On account of the impossibility, so signally shown at Port Arthur, of supporting the intervals between the forts by rifle fire from the flanks of the forts when the forts are subjected to artillery fire, it is necessary to construct special protection for the firing lines on the flanks. Concrete or armored galleries serve this purpose. Among those who did not take part in the war and see the advantages of such galleries in practice, our celebrated engineer, A. P. Shoshin, alone shares our opinion on this question. He constructed such a gallery in 1905.

His gallery, however, can be used only on the front face, as it is open in rear and affords no protection against enfilade and reverse fire when placed on the flanks. The galleries which we propose are closed altogether. They are covered at the top with 4-inch steel armor which, according to General Durlacher's tables, can not be penetrated by 11-inch mortar shells at a range of $3\frac{1}{3}$ miles. The gallery is divided every $10\frac{1}{2}$ feet by 2-inch concrete traverses, which serve to localize the effects of gases and shell fragments in case the armor should be pierced. Moreover, this allows the armor to be placed in sections and fastened to the traverses and to the rear wall of the gallery.

Two or three reserve plates are provided to cover damaged places temporarily and to replace broken plates. The gallery is provided with ventilators at the top. To provide additional protection in rear the gallery extends 7 feet in front of the banquette, which permits a layer of earth to be placed in rear and an infantry parapet to be placed on top. The parapet may be used by the reserves, especially at night, when the enemy can not fire effectively with his artillery. Traverses should be built on the banquette during mobilization. The men will be covered from the front by shields, as shown in profile 8, Plate X.

In the gorge angles of the galleries are armored turrets for machine guns, somewhat advanced, so as to increase the arc of fire. A covered passage leads from these gorge angles to the covered passage or corridor in rear of the gorge casemates. There are ten casemates for the men, an officers' quarters, a kitchen, and two latrines for ten persons each. Large recesses may be formed in the rear wall of the corridor for the storage of supplies.

Almost without exception the Port Arthur forts were absolutely cut off from the fortress during bombardments and assaults. The approaches near the forts were fired upon by the enemy, and it was impossible to reach the forts. Hence the reserves could not reach them in time to reinforce the garrisons. This occurred not once, but frequently. It is therefore of the utmost importance to have safe communication from the fort to the nearest place in its rear capable of covering movements of troops, such as a depression, ravine, wood, or hill. The defenders of Port Arthur are almost unanimous in favor of such communications. An underground gallery for this purpose is shown leading to the rear from the central casemate.

For the transportation of heavy articles ramps are made in the counterscarp and the scarp of the gorge ditch.

On account of the properties of the soil (sand) and for the purpose of increasing the obstacles to assaults, the scarp and counterscarp are made of concrete in the shape of galleries. The flanking casemates are in the counterscarp. Each flanking casemate has one 57-mm. and a machine gun and an embrasure for lighting the ditch. The flanking casemates and the counterscarp galleries are protected by a countermine system running 100 feet to the front. The gallery in the scarp is protected in the same way, but here the countermine system runs 14 feet below the first system. The gorge counterscarp need not be revetted.

Observation may be made from two turrets placed on the ramparts of the front face for this purpose, from the machine-gun turrets, and from the firing galleries. The gorge ditch is flanked by four machine guns in the caponier adjoining the casemates. Embrasures are provided for lighting.

The thickness of the concrete in all constructions is 9 feet with the exception of the shelter for the counter-assault guns

where reenforced concrete 7 and $7\frac{1}{2}$ feet is used and for the underground passage from the casemates, the location of which is difficult to find. Where reenforced concrete is used the thickness of the walls may be considerably decreased.

The opinion formerly held that the defense of the intervals could be effected by the cross fire of artillery from points of supports, brought about the proposition to construct in the forts, rear intermediate caponiers^a and casemated flanks.^b It was thought that the forts would be capable of giving each other such a strong mutual support that something like a "fire curtain" would be formed in front of the interval, which the enemy would be unable to penetrate. But doubt arose as to the reliability of such defense. Among various propositions for strengthening the defense of the intervals, that of General Todleben, developed by Colonel Velichko, and later the proposition of Lieutenant-Colonel Prussak, favored the permanent fortification of intervals. In Chapter IV, I spoke of these propositions, and stated that the first days of the attack showed that the expectation of basing the defense of the intervals exclusively on the fire of the forts was visionary.

It was found that it was impossible to combine the infantry fire of the forts with the fire of the rear caponiers, that forts can not give infantry fire support during the day, and that the operations of the rear caponiers are greatly hampered by broken terrain. In the night the infantry could fire while the fire of the caponiers could not be utilized to advantage. Searchlights afforded some assistance, but little in broken ground. Without the expenditure of enormous amounts of ammunition modern conditions are such that forts can not support the intervals by infantry fire under the fire which may be concentrated upon them. It was proved that trenches and temporary works can not withstand the onrush of an energetic attack. It was proved, too, that the enemy can, by skillful demonstrations, easily deflect reserves from the point where they have decided to break through, and that the reserves should not, therefore, be relied upon to prevent the enemy from penetrating into the fortress.

^a Colonel Velichko.

^b Colonel Prussak.

CHAPTER X.

(See Plate I.)

CONCLUSION.

In summarizing all that has been said upon the many questions raised by the siege, we come to the conclusion that the siege of Port Arthur, in addition to affording information on other topics, showed decisively that the fate of a modern fortress is decided on the line of forts. This was clear before the siege. Port Arthur only confirmed it. The fortress succumbed the day after the line of forts fell. This demonstrates the secondary importance of enceintes and intermediate lines of defense and shows the line of forts to be the main fighting line, the vital part of the fortress.

Having taken as an epigraph for our work the words of Colonel Velichko, "On this line of forts the battles for the defense of the fortress must be fought; here the artillery and infantry must offer a decisive resistance to the enemy," and fully sharing his conviction, we have considered, in as detailed a manner as possible, the measures necessary to enable the garrison to offer this decisive resistance to the enemy.

One of the proposed measures was the erection of permanent works in the intervals between the forts—i. e., the construction of sections of permanent parapets with ditches. This solution is not new. It has been proposed many times; it has given rise to many discussions; and will doubtless be the subject of many a future controversy. I am convinced, however, that I am more favorably circumstanced than my predecessors, for I am able to base my proposition not upon theory alone, but upon experience in war. It is possible, indeed, that I have failed to understand the questions involved and have made incorrect deductions.

Let us try to sift the matter. The quotation from Colonel Velichko shows clearly the importance which he attaches to the line of forts. Deciding here to make a most energetic resistance on this line, he has sought the means by which fortifications may assist the artillery and infantry most effectually.

Basing all deductions upon examples from the assaults at Port Arthur, we have said that the idea of defending the intervals with the aid of the cross fire of forts, correct in itself, can not be relied upon alone, but needs an essential and indispensable supplement in the form of permanent parapets and ditches between the forts. Only thus is it possible to put into practice the fine conception contained in our epigraph.

Our conclusion is based upon the important part played by the Chinese wall during the assault in the night of August 23-24, when, owing to its existence, a small reserve of two companies succeeded in preventing the enemy from breaking through on a wide front. We would invite attention to the importance of this wall during the rest of the siege.

The first consequence of this unsuccessful assault was a radical change in the enemy's plan of attack. A council convoked on the following day by General Nogi came to the unwelcome but definite conclusion that it was impossible to break through the interval, however desirable it might be to do so, and that the fortress could be taken only by regular siege operations.

On the morning of August 26 the first siege works, consisting of long covered communications from the captured works, Fortifications Nos. 1 and 2, back to the Japanese lines, were begun, and on the 31st the direction of the first parallel was clearly defined. After this, approaches were begun from the first parallel to Forts Nos. II and III and to Caponiers Nos. 2 and 3.

The failure to break through inspired such awe in the Japanese for the Chinese wall that even after capturing the caponiers, the last remaining works in the interval between the forts, they did not assault it again, but continued siege operations, not only against the forts, but against the wall itself. Having approached it to within a distance of 15 to 30 paces, they began mining operations against it in December.^a

^a "The successful repulse of this fearful attack gave the Russians more than four months, because it forced the enemy to retreat. * * * Undoubtedly this was the greatest success which could be obtained in a struggle with so bold and determined an enemy." *Die Kämpfe um Port Arthur.*

The third important benefit gained from the Chinese wall was that it enabled a small garrison to hold a wide extent of front, and thus released a large part of the general reserve for the defense of such important positions as 174-Meter Hill. Undoubtedly it was only the existence of the Chinese wall that curbed the impulse of the Japanese for decisive action, made them resort to the slow operations of a siege, and enabled us to gain four months and hold 174-Meter Hill until December. This was so evident during the siege that there was no difference among the defenders as to the value of the Chinese wall to the defense.

Having demonstrated the actual possibility of breaking through intervals between forts, having shown that trenches and temporary works are not sufficient for the defense of the intervals, and having supported our conclusions by descriptions of combats and a series of official telephone messages, we proposed to strengthen the intervals by permanent fortifications. We are firmly convinced that a different solution of this problem is impossible.

One question remains: Should all the intervals be furnished with permanent fortifications? The answer to this question depends upon the nature and purpose of a fortress.

The purpose of a fortress is, according to Professor Engman, "to detain around it the greatest possible number of hostile troops for the longest possible time with the smallest possible garrison." In a later edition of his work this definition is somewhat altered and reads:

The purpose of a fortress is to enable the smallest possible garrison to defend a given strategic point for the longest possible period, detaining around it the greatest possible number of hostile troops.

In the last edition, published this year and edited by Colonel Zubareff, this definition has undergone another change—

The purpose of a fortress is to defend a given strategic point with the smallest possible garrison for the longest possible period against numerically superior forces of the enemy.

Thus within a period of ten years the definition has undergone a series of changes. The only cause is to be found in the want of clearness in the meaning of the term "fortress." That this is the case may be seen if we examine the definition in the essay of 1895. This definition is conditional, non-

committal. We do not receive a clear conception of the purpose of a fortress, but only the vague images—"the greatest possible number," "the longest possible time," "the smallest possible garrison." All is "possible" and nothing more. Not a word is said about stubborn defense or the holding of what is being defended, as if the entire sense lies in the expression "detain around." It is evident that the author of the definition perceived its vagueness. He formulated it somewhat differently in the next edition; but the vagueness still existed, although somewhat diminished. The definition was still conditional.

The third form of the definition is clearer than the others, but even there "possible" is used twice. Lastly, according to the definition of Colonel Velichko, the purpose of a fortress is "the protection of important strategic points on the main theater of war for the purpose of assisting as much as possible the defensive as well as the offensive operations (maneuvering) of the field armies."^a This definition is more definite than the others, but it is conditional. The exasperating "possible" remains, and the definition is made more obscure by the addition of the word "maneuvering." This term called for a further definition which we forbear to quote.

Fortresses have existed since the most ancient times and will ever continue to exist for one purpose only, the "stubborn defense of a given point." The shape of fortresses has changed, as well as their dimensions, armaments, garrisons, and outworks, but their purpose can not change. The "point" and the "fortress" must not be confounded. The value of a point may change. To-day it is important for political reasons; to-morrow its political importance may have passed away and it may have only a commercial importance; later, its strategic importance may be recognized, etc. The value of the point depends on various circumstances, but the object of its fortifications will always be the same. Only with a change in the importance of the point can the shape and extent of the fortifications be changed.

We therefore arrive at the following definition: "The purpose of a fortress is to assist in the stubborn defense of a given point until the end of the war."

^a Velichko; "The Engineering Defense of the Country."

The importance of the point from a strategic point of view determines the influence of the fortress upon events. Thus the fortress may protect a crossing, secure a line of communications, or shelter an army. Depending upon the importance of the point, a fortress is built so as to fulfill its proper rôle, and this is attained either by dimensions or armament. This importance may be seen long in advance or only during the course of a campaign. Fortresses, accordingly, are built either during peace or in time of war, and although one and the same purpose is served, namely, defense, the stubbornness of the defense will vary.

In the course of the same campaign the strategic importance of a point may vary, but the purpose of the fortress remains the same. Let us take the case of Liaoyang. At the beginning of the war it served as a point for the deployment of the army. A temporary fortress was erected. When the lines of advance of the Japanese became clearly defined in August, 1904, Liaoyang became important as a position to prevent their further advance, but its fortifications had still the same purpose—stubborn defense, resistance, protection. Undoubtedly the fortifications enabled General Kuropatkin to maneuver with his main forces against Kuroki, but this was only of an accidental and secondary importance, while the essential purpose of the fortress remained unchanged.

There are many historical examples of the use of fortresses for such strategic purposes, from which we may see that fortresses have often assisted armies to maneuver. But these examples prove that this use of fortresses was rarely foreseen, and that in most cases it was accidental and always secondary. The principal thing which was, is, and ever shall be demanded of a fortress is the stubborn defense until the end of the war of a point which the country has found necessary to hold and has fortified for this purpose. It is this purpose which must be considered in the planning and construction of fortresses. This is the indispensable requirement calling for their erection and is the whole object of their existence.

It is not alone for the rational construction of fortresses that it is necessary to have a clear conception of their purpose. It is equally important that the commandants defend-

ing them be thoroughly penetrated by this idea, and that they adopt no other. If Marshal Bazaine had grasped this idea, if he had understood clearly the purpose of the fortress which he commanded, he would never have said that once Paris was blockaded, Metz had played out its rôle, that it was no longer necessary, and could be surrendered. So also with Port Arthur. It could not be inferred, when the concentration of Kuropatkin's army had been completed, that the rôle of Port Arthur was at an end.

General Leer has said that "to name a thing right is to understand it right." As the correctness of action depends upon correctness of understanding, we shall paraphrase General Leer's aphorism as follows: "To name a thing right is to understand it right and to use it right." Therefore it is most important that those who construct and those who command fortresses should understand once and for all that the purpose of a fortress is "to assist in the stubborn defense of a given point until the end of the war." Then only will fortresses be properly constructed and properly defended.

Bearing in mind the purpose of a fortress and remembering that the fate of a fortress is decided on the line of forts, we come to the conclusion that it is necessary to construct permanent works in the intervals between the forts. These works must consist of a ditch covered by fire, boomproof shelters for the garrison of the intervals, and parapets for the infantry and the counter-assault artillery. As the parapets will sometimes serve as a screen for the batteries in the rear, no definite dimensions can be prescribed for them. In some places high massive earthworks will be required, and in others, trenches sunk into the ground. All depends upon the requirements for effective fire, screening, and concealment.

In answer to the question as to what intervals should be fortified, we would say that they should all be fortified according to the necessities in each case. All, however, can not be well fortified without great expenditure of funds. Some intervals will have good natural obstacles, so that artificial obstacles will not be required, and some will be intersected by deep rocky ravines, where the construction of a ditch would require deep cuts and high fills. Here sections of parapets should suffice. Every fortress and every interval requires a different solution. The necessity for active de-

fense requiring sorties must be considered and passages must be left for this purpose. The entrance of a field army into the fortress must also be considered. For this a greater number of passages is required. In fortresses where no maneuvering is to be expected these passages should be few in number; in fortresses where armies will assemble or advance or retreat there should be many passages.

The construction of such passages will not violate the principle of the closed work and need not interfere with the fortification of the intervals. These passages will correspond to the gates of ancient fortresses. They may be closed easily at the last moment, nor will it be necessary for this purpose to use such a great force of laborers as is required to fortify the intervals during mobilization. The question as to the most probable point to be attacked must not be solved in advance, except in cases where, on account of local conditions, some of the intervals can not be attacked. It must be assumed that each front which does not present any insurmountable obstacles may be attacked. The intentions of the enemy can not be discovered in advance, and an assumption that one front is more liable than another to attack is always without foundation and nearly always erroneous. This was shown at Port Arthur, where it was assumed that the west and not the east front would be attacked.

It has already been said that the purpose of a fortress is stubborn defense until the end of the war. The commandant should be imbued with this idea and should be given independent command.

When the purpose of a fortress is clear to the commandants of fortresses, there is no need for commanders of fortified regions, who will only violate unity of will and authority. The great size of modern armies renders the fortification of one strategic point (as, for instance, Port Arthur) of small importance in the development of military operations in general. At present it is necessary to have an extensive system of fortified places between which field armies may operate absolutely independent of the fortresses. With their flanks and rears secured by fortresses, armies that have not had sufficient time to mobilize may oppose numerically superior forces without fear of being cut off or defeated. Armies must not take refuge in fortresses; but they may

pass through them, take advantage of crossings, and use them as supports to secure their flanks or centers. Had the system of fortifications of the entire Kuangtung Peninsula been adequately prepared, it would have played a different rôle in the late campaign and would have protected Port Arthur and the fleet until the end of the war. The fortifications at Liaoyang would also have played a different part, if, in addition to Liaoyang, the Yantay mines and the crossing below Liaoyang had been equally well fortified.

With this I close my investigation. Many may fail to agree with my solution of the questions here presented, but I console myself with the hope that my work will evoke discussion of these questions by my comrades in arms and by others interested in this branch of military science. May the Lord assist their competence and love of country to an early solution of the questions involved, so that the comment of Frederick the Great may not be applied to Russian fortresses: "In spite of so much labor and such terrible appliances, modern fortresses are not impregnable."

I wish to record my profound gratitude to those of my comrades in the defense of Port Arthur who have assisted me in matters pertaining to their special branches; in particular I wish to mention Major General Stolnikoff, Lieutenant Colonel Gobiato, and Captain Vysokikh, of the Artillery; Colonel Krestinski and Captains Rodionoff and Dobroff, of the Engineers, and Captain Romanovski, of the General Staff.

ST. PETERSBURG, *September, 1906.*

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